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Eliminating Blue Prints in Machining

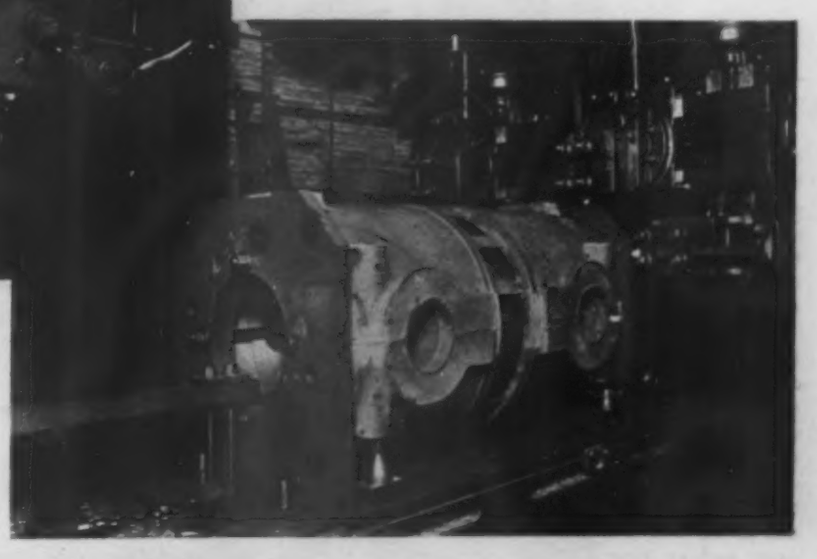
Jigs Registering from a Machined Surface Are Used for Tool Setting—"Greased Air" Employed in Deep-Hole Drilling

DOING away with the need for the machinist to use blue prints, surface gages and scales in setting up, and to check his work, obviously saves much of his time which otherwise would be consumed in that manner. While, of course, all work is not suitable to be handled without measuring, some of the jobs done by the Worthington Pump & Machinery Corporation, Snow-Holley Works, Buffalo, are adaptable to this method.

Typical of this manner of handling some of the work, one operation shown in an accompanying illustration is the planing of bosses on three sides of horizontal gas engine cylinders, these bosses being for the mounting of valve cages and cam shaft hangers. The cylinder, having first been bored to finished size and ends faced, has attached to it two jigs, one at each end, bolted on by through bolts. These jigs are so made that they fit into the cylinder bore by pads machined on one side to cylinder diameter. One edge of each jig is made to serve for feet to support the cylinder. The other three sides are exactly to the required size for the bosses when machined.

By setting his tools to the edge of the jig, the operator is assured of planing the cylinder to desired dimensions. Two roughing tools are carried in one clapper box, one tool being slightly in advance of the other. This cylinder is so made, incidentally, that it may be reversed, after being in service, thus renewing alinement of the engine. This same principle is used in cross planing horizontal engine beds, which first are

(At Left) Rod Brasses, after Being Split and Bored, Are Turned in a Vertical Boring Mill. The brass is clamped securely to a mandrel which is a facsimile of the journal on which it is to be run



(At Right) Planer Tools Are Set to Finished Edges of the Fixture, to Avoid Necessity for Using Measuring Tools and Blue Prints

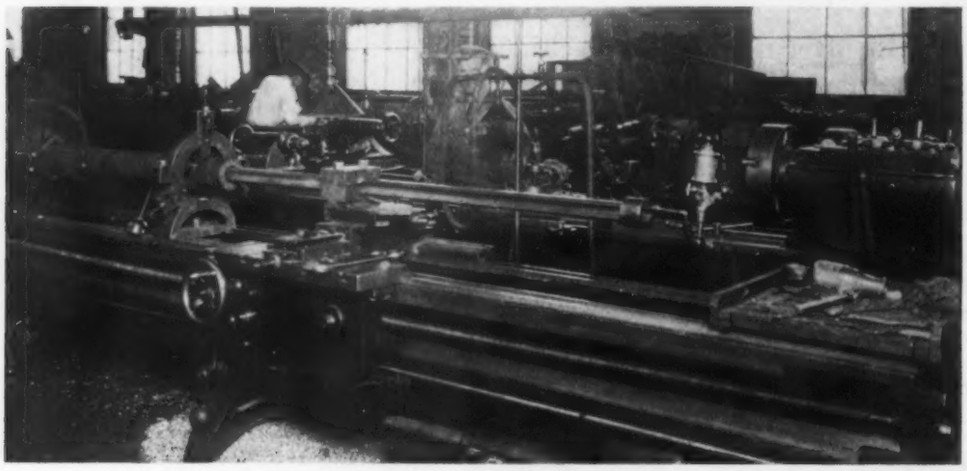
bored and faced for cylinder fit, cross head guides, etc., then bearing boxes planed by setting tools to a jig registering from the bored surfaces.

In the case of a large bed built some time ago, the casting for which weighed 225,000 lb., a 36-in. planer was mounted on the casting, with a tool strapped to the planer table to plane the bearing boxes.

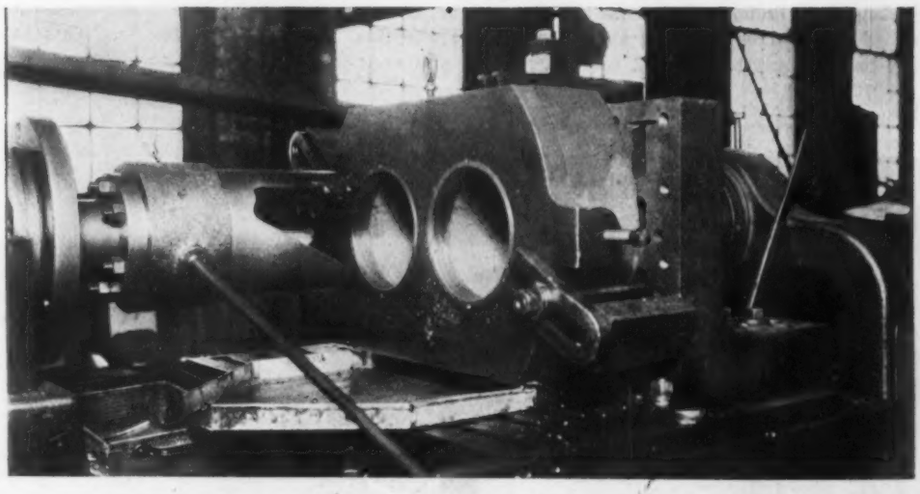
Similar methods are used in machining vertical cylinders, three of which are mounted on three jigs on one planer, set by tongues on the jig bottoms to aline them in the planer table tee-slot. Tools are set to the jigs for planing pads, again avoiding use of the blue print in the planing operation.

dripping from an ordinary drip lubricator. The combination forms a "greased air" which lubricates the drill, cools it and removes chips.

To assure perfect crank webs without chance of pipes or other defects, the forged webs after machining on the outside have the shaft and pin fits trepanned in a horizontal boring machine. A jig is employed which has the two holes laid out at proper centers and bushed with hardened bushings. This jig is placed with its edges parallel with the edges of the web and its ends are provided with set screws in lugs to hold it in place on the forging. The trepanning tool has three bits of high-speed steel set in a mild-steel shell. Back of each



(At Left) Lubricated Compressed Air Is the Means Used for Cooling the Bit and Clearing Chips in Deep-Hole Drilling



(At Right) Cutter Lubricant from a Pressure Pump Is Carried Through a Stuffing Box and Distributed to Ducts in the Trepanning Head to Each Cutter

To secure concentric bore and turned surface in connecting rod brasses, the brasses, after being split and bored, are placed on a mandrel which duplicates the diameter of the pin journal. By means of four angle clamps at top and bottom and a jam nut at the top these brasses are held securely with correct inside diameter, ready to have the outside turned on a vertical turret lathe.

An unusual method of clearing chips and lubricating the cutter is employed in this shop on deep-hole drilling. Work is carried in a long-bed lathe spindle and steady rest. The drill is made of a shaft in which a chip clearance groove has been milled and along one side of which is carried a tube for coolant and lubricant to the cutter, which is inserted in the front end of the bar. The bar is mounted in a special rest on the lathe carriage and has at its rear end a connection for attaching a lubricator and air hose. Chips are blown out through the clearance groove by compressed air, which picks up oil bit is a duct for coolant, leading through the shell walls to a stuffing box close to the machine spindle. To this stuffing box is attached a pipe leading from a pump which generates pressure for the coolant.

American Institute of Weights and Measures

The annual meeting of the American Institute of Weights and Measures will take place at the Engineering Societies Building, 29 West Thirty-ninth Street, New York, on Thursday, Dec. 4, at 2:30 p. m. C. C. Stutz, 115 Broadway, New York, is secretary.

Wholesale prices of plumbing fixtures are reported by the Department of Commerce at 71.9 per cent above the 1913 average. This is the lowest figure during the past 18 months, there having been a practically steady decline from 92.7 per cent excess in June, 1923.

Development of Gas and Oil Turbines—I

Use of Intermittent Impulses Found to Give Results Where the Continuous Impulse Method Failed—German Inventor Produces Unit for Steel Works Use

AFTER years of experimentation, prosecuted since 1918 very intensively, a gas turbine and an oil turbine, especially suited for use in large sizes, have been developed by Hans Holzwarth, chief engineer of Thyssen & Co., Mülheim, Germany. The combination of research and practical trials has resulted in establishing an operating cycle and conditions under which, while still maintaining high thermal efficiencies, the average temperatures to which the blades are subjected do not exceed those in a modern steam turbine. This makes one of the chief differences when comparison is made with the continuous explosion principle, under which the temperatures were excessive. With the intermittent method used, the principle reverts to that of the piston gas engine in that there are are successive elements in the cycle—explosion, expansion, scavenging and readmission of the fuel and air. It is the combination of scavenging and the relatively large interval between explosions which results in cooling, and thus protecting the blades from the excessive temperatures of the newly exploded gases.

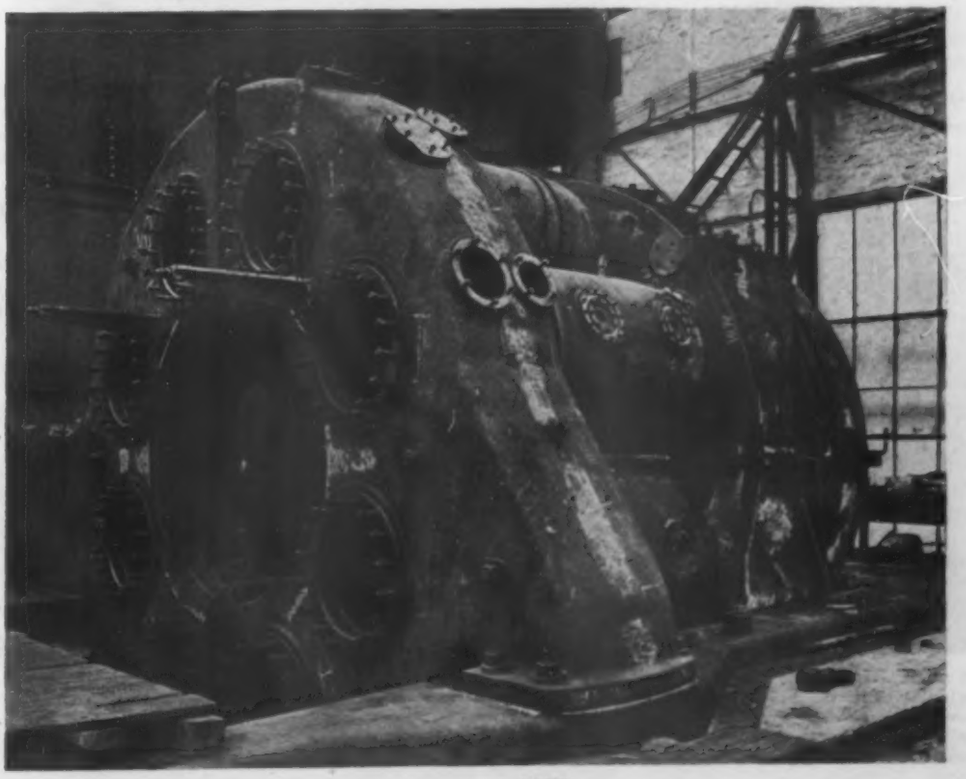
It is anticipated that the chief applications of the gas turbine will be by means of blast furnace and coke-oven gas, gas producers and natural gas. In connection with the two first mentioned fuels, this presupposes location in or near steel plants. Many of the natural gas sources are gradually giving out, but gas from gas producers may be obtained in any locality. Practically all of the tests in operation of the 1000-hp. gas turbine, on which experiments were made, have been conducted since 1918 with coke-oven gas. The use of this gas permits the saving of all the valuable by-products of the coal, the use of the coke for either foundry or blast furnace purposes and the recovery of the gaseous products which now, except for that portion used in distillation, are largely wasted. This would result further in a diminution of smoke from coke-oven plants.

In gas turbines driving turbo-blowers for blast furnaces, a main item is the simplicity. No auxiliary blowing apparatus is required for the gas turbine. The scavenging air is taken from the first stage of the blast furnace turbo-blower and, if additional compressed air is required, this can be taken from the last stage, as the pressure for blast furnace and loading pressure for gas turbine are about the same. The turbo-blower furnishing the compressed gas for the gas turbine would be coupled to the gas turbine. Starting would be accomplished with steam, expanding through a nozzle between the gas nozzles and impinging upon the gas turbine running wheel.

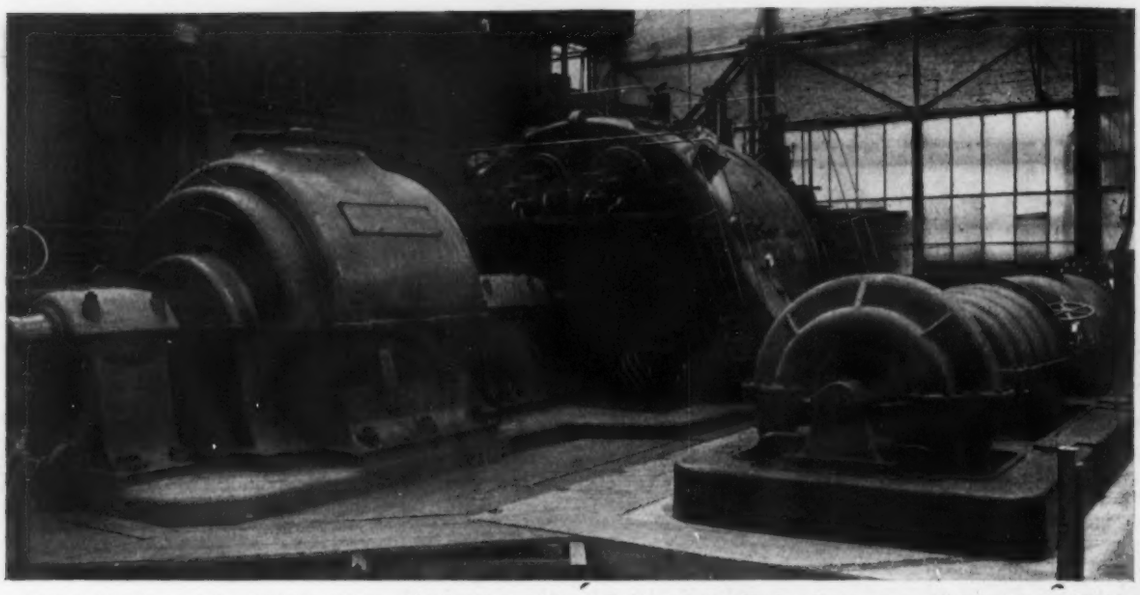
Present tendencies in steel mill operation, whereby electric drive is being extended more and more, with the elimination of steam drives, tend toward the establishment of large power houses and the transmission of power over feeder lines. This concentration lends itself particularly well to the use of the gas turbine placed alongside coke ovens or blast furnaces.

What the Gas Turbine Is

Essentially the turbine consists of a series of explosion chambers located radially around the central axis or shaft. Inlet valves for gas and air in one end admit the fuel and air to the chamber, where it is exploded by ignition from suitable plugs. The pressure thus created sends it out through nozzle valves and thus against the blades of the turbine wheel. These blades are in two stages, after passing which the excess gases are led away. The explosions are timed in a definite cycle around the circumference, eight explosion chambers being provided in the large size gas turbine, while there are six in the smaller gas and the oil turbine. Although the wheel thus receives intermittent impulses, the explosions come so frequently that the effect is virtually that of a continuous impulse.



Assembly View of the 5000-Kw. Unit. The eight inlet manifold ports show prominently. Their size may be visualized by comparison with the man standing within the machine



Assembled View of the 5000-Kw. Unit with the Generator at Left and the Turbo Compressor (Separate) at Right. The waste-heat boiler does not appear in this illustration

Originally the turbine was designed with a vertical axis. Later designs, however, have given it a horizontal axis to permit easier access to valves and other parts. This consideration was held to outweigh the somewhat greater space required for the horizontal unit.

From the exhaust gas chamber in which the running wheel rotates, the exhaust gases, mixed with scavenging air, flow through the steam superheater, the boiler and the feed-water heater before reaching the atmosphere. With this waste-heat boiler plant all the steam required for driving air and gas compressors is raised by the exhaust gases from the turbine and is superheated.

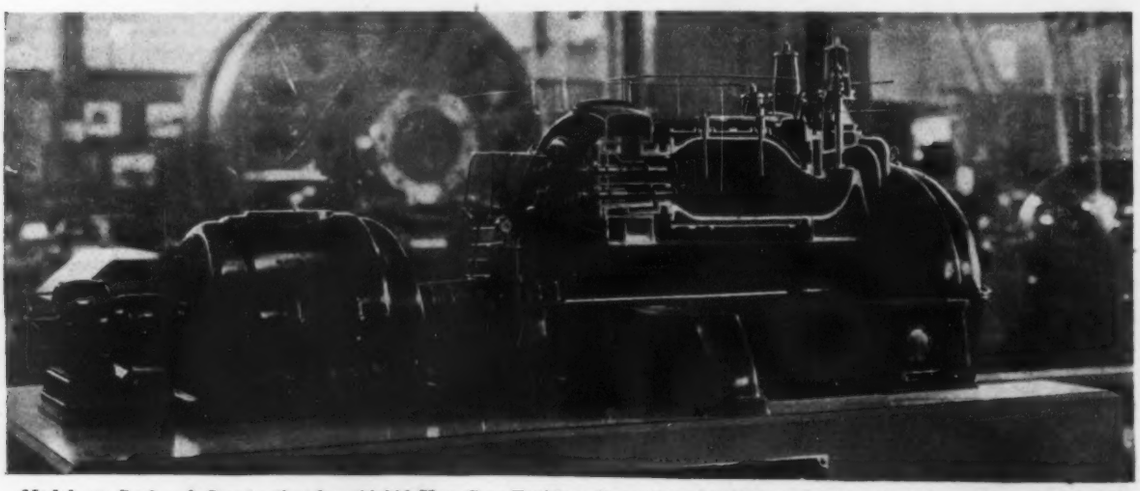
Generally it has been found preferable to fit the dynamo on the air and gas inlet end of the turbine (the cold end) so as not to interfere with the exhaust and the waste-heat boiler at the hot end. In the smaller sizes the running wheel is arranged as a free disk, supported on only one side, which simplifies the general design. In the larger turbines, however, an outside bearing is fitted, thus giving the wheel support on both sides. For the 5000-kw. unit the wheel has a diameter of 9 ft. and weighs 12 tons. To avoid possible injury to the turbine blades, a special carrying structure is used in handling the wheel to and from the machine when overhauling.

Gas and Air Inlets and Explosion Chambers

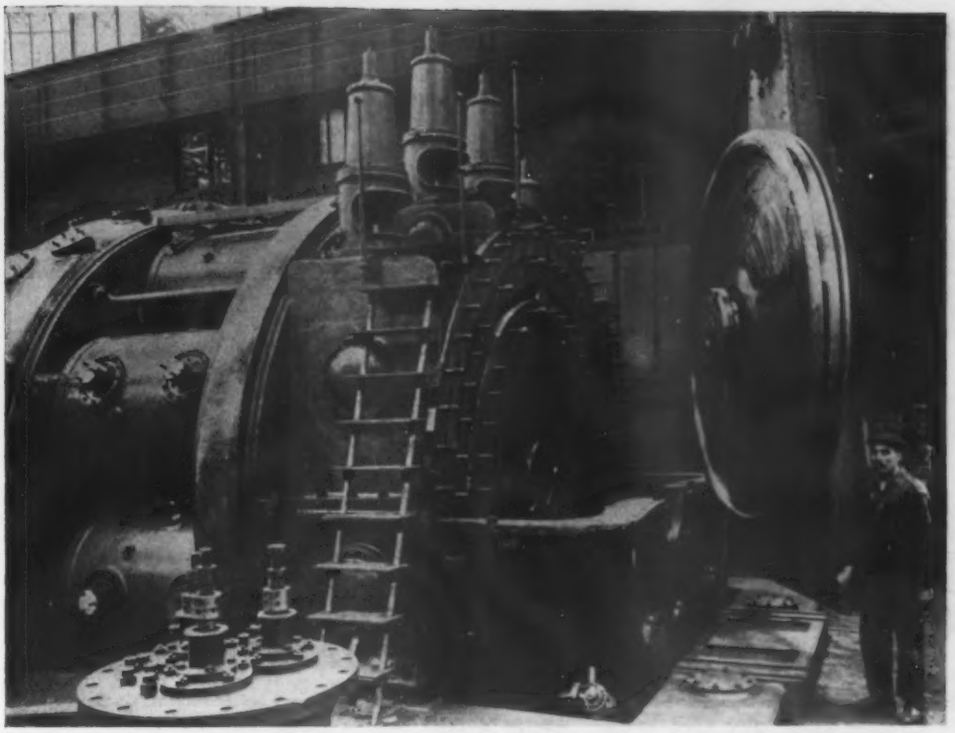
When working with gas of low heating value, such as blast furnace or producer gas, the turbine requires two inlet valves for each explosion chamber—one for air and one for gas. When designed to operate on rich coke-oven gas, a third inlet valve is required to provide for the entrance of additional compressed air. The oil turbine also requires three valves, one for air, one for the liquid fuel and one for the additional compressed air.

Compression pressures in the explosion chambers are about 40 to 50 lb. above atmosphere and with a temperature at about 200 deg. Fahr. While the mixture is eddying it is ignited by high-tension plugs. The whole mixture is burned before the nozzle valve opens, the combustion of the amount of gas admitted producing a pressure of about 250 lb. above atmosphere, at a temperature of about 2500 deg. Fahr. At the moment of maximum pressure the nozzle valve is opened rapidly to its full extent by means of the initial explosion pressure and expansion begins. The gases expand through nozzles of the deLaval type to the exhaust pressure, slightly above the atmosphere, and drop in temperature to 1250 deg. at the end of the nozzle. The explosion and expansion cycle and the impulse imparted to the wheel last only about one-fifth of a second.

As soon as the expansion is finished, air is scavenged through the explosion chamber, nozzle valves and nozzle, sweeping out of the chamber and ducts any lingering gases and thereby cooling all the parts. This scavenging air, mixing with the expanded products



Model on Scale of One-tenth of a 10,000-Kw. Gas Turbine Operating at 1500 R.p.m. and Direct Connected to a Generator. Beginning with the bearing between the generator and the turbine and moving toward the right are seen the inlet manifold with inlet valves for gas and air, a section of one of the explosion chambers with two ignition plugs projecting into it, a nozzle valve with its stem running up into the hood above the turbine, the nozzle segments, the running wheel (pretty well hidden by the shadow) and the cover over the exhaust gas chamber



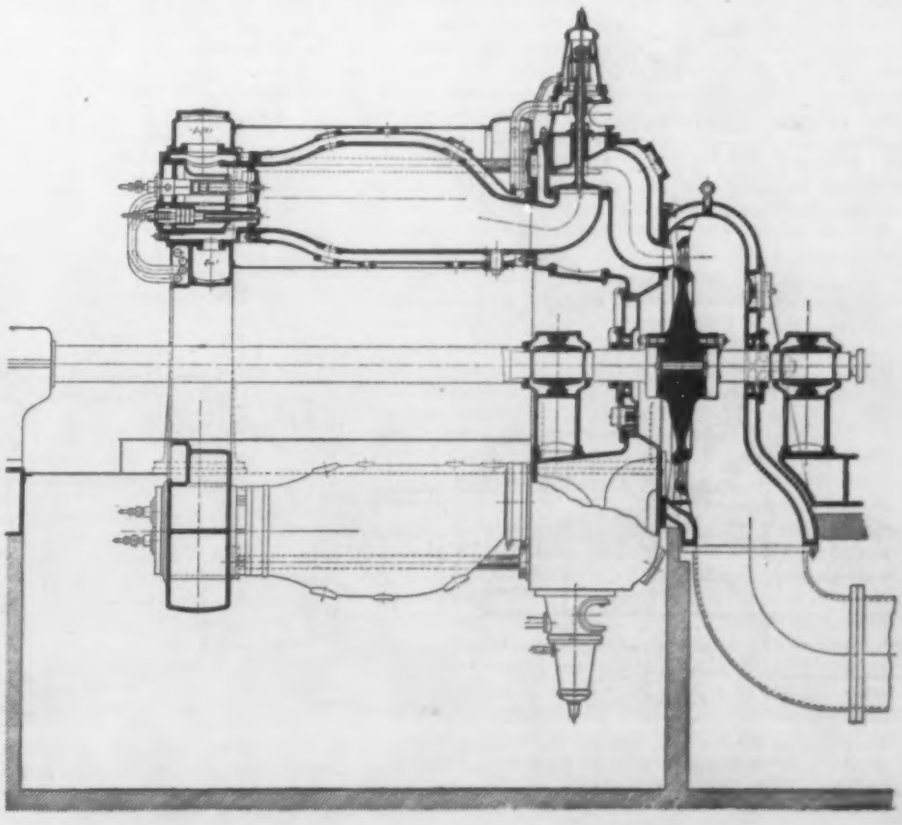
Partially Assembled Gas Turbine of 5000 Kw. Built for Commercial Use. This shows the rig used in handling the blade wheel to avoid damage to the blade segments. It shows also the arrangement of explosion chambers about the axis and the connections of the two ignition plugs in each chamber. The four nozzle valves operating in conjunction with the four hoods appear prominently above the unit. There are four similar nozzle valve outfits, also with vertical axes, and placed below the floor

of combustion in the turbine wheel chamber, reduces its temperature to about 800 deg. This is the highest temperature to which the thinnest parts of the running wheel vanes are submitted, while its mean temperature is somewhat lower, owing to heat being radiated to the water-cooled walls of the wheel chamber. This scavenging lasts from ½ to 1 sec. The nozzle valves then are closed and the gas and compressed air inlet valves opened for a new charge.

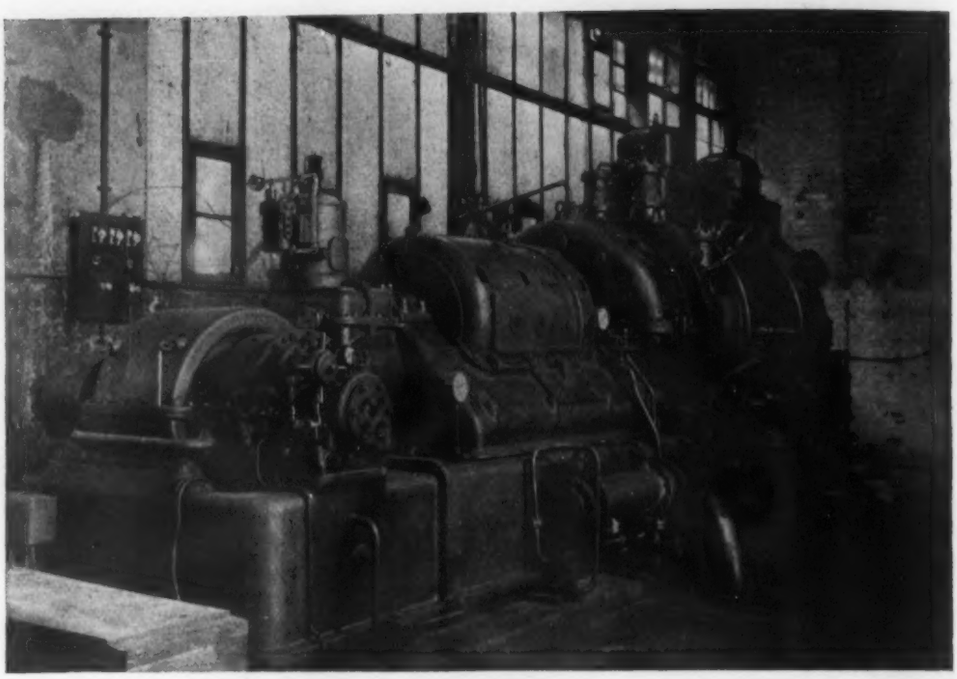
Temperatures at the Turbine Wheel

One of the most difficult problems to be met lay in the impinging of high-temperature gases on the turbine wheel vanes. Mr. Holzwarth found that, with suitable material for these vanes, the jets of combustion gases can hit the vanes without any disadvantages, provided they do so for only a relatively short time, and are followed by that part of the cycle in which cooler gases surround the vanes and by a further period in which cold air comes in. The momentary high-temperature conditions do not hinder the success of the operation.

In contrast with the action of gases in the gas engine cylinder, it must be borne in mind that in the gas turbine the combustion gases impinge directly on the material of which the turbine wheel is made. In the gas engine, on the other hand, they do not impinge, but come into contact with oiled surfaces. Necessity



Longitudinal Section of the 10,000-Kw. Unit Designed for Operating at 1500 R.p.m. Positions of the inlet manifold valves, the explosion chambers, the nozzle valves and the wheel are indicated clearly, as is also the duct at the lower right for carrying away the exhaust gases to the waste-heat unit, where much of the remaining energy is to be extracted



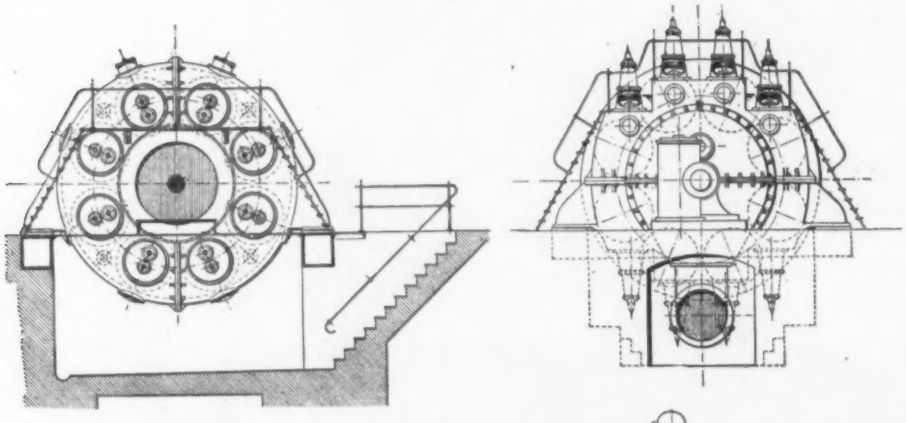
Direct Connected Oil Turbine of 300 Kw. In the oil turbines and the smaller gas turbines only six nozzle valves are used, four with vertical stems above the axis and two with horizontal stems, one on either side, a little below the axis. Three of the former and one of the latter show in this illustration

for maintaining these surfaces continually oiled limits the temperature of the explosion gases in the gas engine cylinder, this being controlled by the cylinder oil temperature. As these oiled surfaces do not exist in the gas turbine, its combustion chamber walls may be maintained at a much higher temperature than in gas engine practice, and with consequent less heat loss in the cooling water.

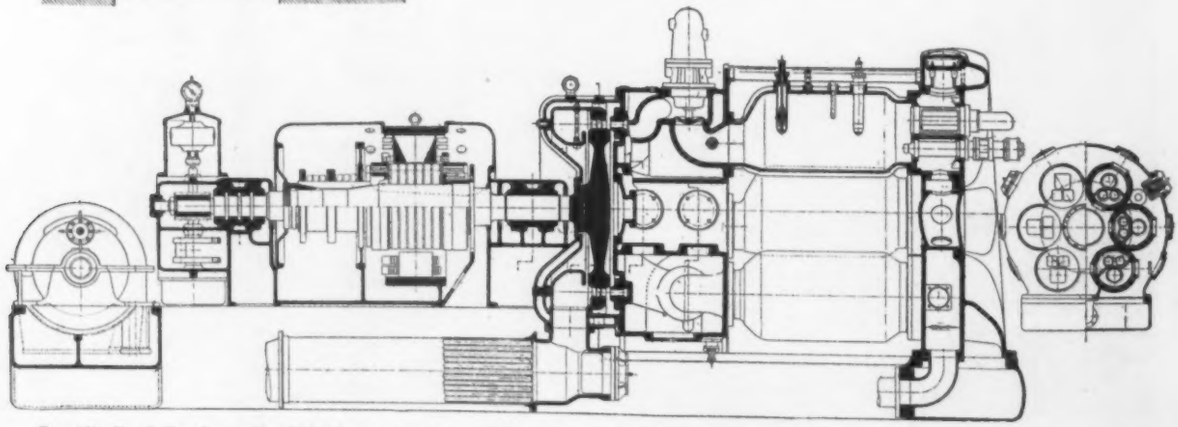
Apart from reasons of lubrication, unless the walls of a gas engine cylinder are kept fairly cool, the weight of the explosive charge and consequently the power output of the engine must be seriously reduced. As the charge is forced into the combustion chamber of the turbine, however, by a compressor working at 40 lb. per sq. in., this disability disappears.

One main distinction between the operation of the Holzwarth gas turbine and that of a steam turbine is this: In the steam turbine the steam impinges upon the turbine blades continuously and with uniform velocity; in the gas turbine the combustion gases are projected from several nozzles through the turbine wheel blades like machine-gun fire.

The highest peripheral pressure of the combustion gases is several times the average pressure during



End Views of the 10,000-Kw. Unit, That at the Left Showing the Inlet Manifolds, while That at the Right Shows the Exhaust Duct at the Bottom and the Arrangement of the Eight Nozzle Valve Hoods with Vertical Axes, Four at the Top and Four at the Bottom



Longitudinal Section of a 500-Hp. Oil Turbine and Dynamo Designed for Operating at 3000 R.p.m., with Compressor at the Left Running at 5000 to 6000 R.p.m. The general arrangement of the machine is similar to that of the gas turbine. There are, however, only six explosion chambers (see small end view at right) in place of eight and the two lower chambers have horizontal nozzle valves

the emptying of the combustion chamber. It is many times that which obtains between the two explosion portions of the cycle. This difficulty of unequal loading of the blades is cared for by employing a strong blade section, to withstand not only the heat but the rapid and violent pressure blows from the nozzles.

Record of Progressive Development

Practical development of the gas and oil turbine has been achieved with five successive units, four gas turbines and one oil turbine. Changes made in the design, while under test, have resulted in the successive development of the machines to that at present offered for power use. The first small turbine of 50 hp. at 3000 r.p.m. was built in 1908 by Korting Brothers in Hanover. This was followed by a much larger unit of 1000 hp. at the same speed, which was built in 1910 by Brown, Boveri & Co., at Mannheim. The third unit, 700 kw., at the same speed of 3000 r.p.m., was built by Thyssen & Co., at Mülheim, in 1914. All three of these were vertical units. The fourth gas turbine, with a horizontal axis, was a 5000 kw. at 1000 r.p.m., and was built by Thyssen & Co. in 1920, for a central power station. The first oil turbine, of 300 kw. at 3000 r.p.m., was built by Thyssen & Co., in 1919.

Tests with both the gas turbine and the oil turbine have put Thyssen & Co. into a position to build units of both types for industrial use. These tests have provided them with information so that proper guarantees can be given as to heat economy and durability.

(To be concluded)

Standardization Work Growing Abroad

Important industrial developments in all the industrial countries of the world are being brought about through standardization, according to a statement of the American Engineering Standards Committee. In 18 countries this important movement heads up in national standardizing bodies.

A saving of $18,000 on each of 57 locomotives recently ordered by the Swiss National Railroads is the result of applied industrial standardization in Switzerland.

Organization of a national standardizing body in Norway, which has been in progress for two or three years, has now been completed.

"A united Poland" in the technical field is the result of the newly established technical committee for the standardization of industrial products and supplies. Heretofore the Polish military services have tended to follow French standards, while in private industry, the preference has been for German work.

Only two other of the eighteen national standardizing bodies are organized under Government auspices. These are the French and the Japanese.

More than 50,000 copies of printed standards developed under the Dutch standards committee during the past year were sold in Holland. This committee issued 62 standards in final form and 56 draft standards for criticism and review.

Japan began its work by comprehensive study of development of standardization in other countries, a process much facilitated of late by regular exchange of standardization data among the 18 national standardizing bodies now at work. The Japanese have 47 projects under way and are well advanced in work on mechanical and electrical machinery and equipment, as well as the very important fundamental standards of rolled steel sections used in civil engineering and the building trades.

Italy has 39 active projects under way. Particularly important are those for standardization of screw threads, bolts and nuts, pipes and tubes, and steel sections for shipbuilding.

To facilitate the understanding of standardization work in foreign countries, the Germans have proposed setting up a central cooperative translation bureau for standardization work. Many firms in Germany are interested in foreign standards, and the proposal is that each of a number of such firms shall be responsible for the translation of a certain set of standards.

Czechoslovakia, like Japan and Germany, pays particular attention to work going on in foreign countries. Although Czechoslovakia started standardization on a large scale but a little over a year ago, it now has 54 committees and subcommittees with 600 members preparing standards dealing with mechanical engineering subjects alone.

The director of the Czechoslovakian work reports the use of 40 different types of small rails varying from 1⅝ to 3¼ in. in height. During nine years one firm, manufacturing cars for mine railways and industrial trackage, reports having filled orders for cars involving 76 different track gages. The same firm has 1000 different patterns for wheels for such cars.

It is expected that five or six types will likely replace the 40 small rails now in use, and that five track gages, including the international gage for street and steam railroads, will replace the 76 cited. Instead of 1000 different wheel patterns, it is expected that nine wheels of a heavy type and nine of a light type will cover all requirements.

The British Engineering Standards Association, the oldest and largest of the national standardizing bodies, has recently completed an unusually important piece of work. This is a tabulation of the dimensions and properties of standard rolled steel sections for structural purposes.

It begins by setting down methods of calculating the strength of such sections and then presents the standard dimensions adopted for the "sections" used in the construction of buildings and ships, including equal and unequal leg angles, bulb angles, bulb plates, channels, beams and T-bars. A complete set of tables showing the metric equivalents for the adopted standard dimensions is given also.

The Canadian Engineering Standards Association naturally cooperates closely with the Americans on the one hand and with the British on the other. One of their most important projects is a "Canadian Electrical Code," work upon which was started recently, based largely upon the American standard electrical codes for protection against fire and casualty hazards.

Tariff Reductions by Australia

WASHINGTON, Nov. 18—Iron and steel tubes, automobile chassis and parts, printing machinery and adding and computing machines are listed among the products which will be accorded tariff reduction by Australia when imported from Canada, as a result of the recent favorable action by the Australian Parliament upon the long-mooted trade agreement between Australia and Canada. E. A. Chapman, of the Far Eastern Division of the Department of Commerce, points out that Australia's concessions are granted largely to Canada's manufactured products, while Canada's tariff reductions are confined to Australia's primarily agricultural products. At the same time, he explains that in the case of printing machinery, adding and computing machines and cash registers, Canada has contributed very little in the way of exports to Australia. Imports of these articles have originated largely in the United States. Iron and steel tubes, or pipes and automobile parts have originated largely in Great Britain and the United States. In automobile chassis, however, Canada has done very well. Out of Australia's total imports of chassis amounting to £2,927,759, Canada's share reached £782,180 as compared with £1,167,364 from the United States and £445,964 from the United Kingdom.

The one-hundredth anniversary of the announcement by the French physicist and engineer, Nicholas Leonard Sadi Carnot, of the principle of thermodynamics, later known as the Second Law of Thermodynamics, and the Carnot cycle will be celebrated by American engineering, physical and chemical societies and educational institutions of the New York metropolitan district at 8:15 p. m. Dec. 4 in the Engineering Societies Building, New York. Dr. William F. Durand, president-elect of the American Society of Mechanical Engineers, will preside. The speakers will include Dr. Michael I. Pupin, Columbia University, and Dr. William L. Emmet, General Electric Co., Schenectady.

Study of Foundry Building Design

Influence of Site Selection, Building Layout, Material Storage and Methods of Operation on Better Foundry Practice

EXPERIENCE has taught that the location and construction of foundry buildings are contributing factors in their successful operation. The selection of the foundry site has a direct effect on the labor problem, the supplying of raw materials, the market for the foundry's product and the layout of the plant. Facilitation of production, reduction in the cost of material handling and provision of better working conditions are some of the results of careful consideration of the construction of buildings.

Factors to be considered in the selection of foundry sites are labor supply, source of raw materials, transportation, market for product and adaptability of sites to the foundry plant from the standpoints of cost and topography of land.

How One Foundry Selected an Advantageous Site

One of the plants studied employs about 200 men and does a jobbing business. Demands for greatly increased production made necessary considerable enlargement of the existing plant. The management decided that the time was right for considering the possibility of bettering the location of the plant. A study of surrounding conditions brought out the following facts:

Labor Supply.—The plant was located in the suburbs of a prosperous manufacturing community, where a large number of workers might be drawn upon for the needs of an enlarged plant.

Source of Raw Materials.—Pig iron, coke and sand could be supplied in abundance from a nearby community.

Transportation.—Two trunk line railroads passed through the neighboring city. One was connected with the plant by a siding; the second could be reached readily by inter-line connections. Good roads facilitated trucking of supplies and shipment of finished products.

Market for Product.—Excellent transportation facilities brought the outside markets within easy range of the plant. Locally, there was sufficient demand on the output to supplement a large production business from outside.

Cost of Land.—There was an abundance of cheap land in the immediate vicinity of the existing plant, and the expected growth of the city alone would make its acquisition profitable.

Topography of Land.—A little study demonstrated the feasibility of using the natural formation of the land as a means of handling materials with a minimum of effort. The existing railroad siding ran on a shelf formation along the edge of a 15-ft. drop. The extension of the land from this drop provided sufficient space for the needs of the new plant and for future growth. Fig. 1 shows a profile of the plant as constructed at this point.

Facilitating Handling of Materials.—It will be noted that the storage building was constructed so that the second floor level corresponded with the level of the siding. A track was run into the storage building of the plant and constructed to minimize material handling. Storage bins were laid out on the ground floor to permit dumping sand from hopper cars on the siding through hatches into the sand storage bins. Iron was removed from cars by traveling cranes and magnet and piled on the storage floor. Coke was taken from the cars by clamshell bucket and dumped at one end of the storage space.

Electric trucks conveyed unit charges of coke, scrap and pig iron to the cupola charging floor adjoining the storage room. Hopper trucks conveyed sand about the foundry. Freight cars were loaded with completed castings at the other end of the storage floor. Electric platform trucks and elevators conveyed castings ready for shipment into freight cars.

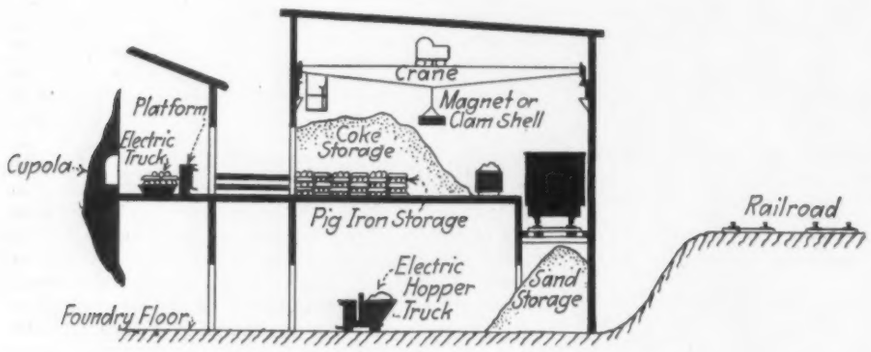


Fig. 1 — Profile of Plant as Constructed

The storage building housed on the ground floor additional departments—core room, pattern shop, active pattern storage, finished stock room, packing and shipments by truck.

Piling pig iron on the storage floor and clearing away coke dropped outside of the coke storage area were the only tasks remaining for the men. The elevated siding eliminated hand shoveling of sand from cars; covered storage bins protected the sand. Laborious work was reduced to a minimum.

Ten years' operation under a progressive management has demonstrated the advantages of the construction described. Contemplated increase in plant is amply provided for by the land acquired.

Practices of Other Plants

In the survey it was observed that developments of the property surrounding long-established plants often obscured the primary reasons for the original selection. Fifty-one of the plants studied had railroad sidings. Ten of these had elevated sidings, which allowed use of the dumping feature of hopper cars.

Several of the plants had found difficulty in securing adequate labor supply. One was just far enough removed from an industrial community to find it difficult to recruit workers. Two plants located in large cities encountered competition from other industries in securing and holding workers. The working conditions in

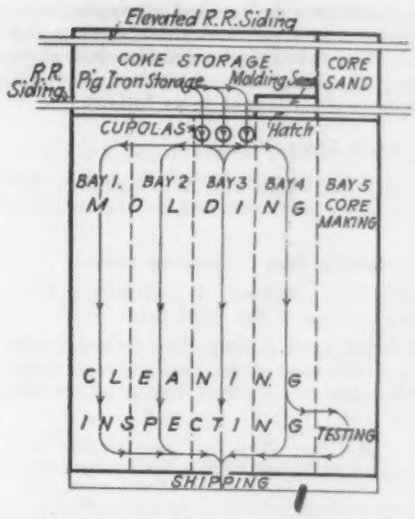


Fig. 2 (Left) An Example of Uniflow Production

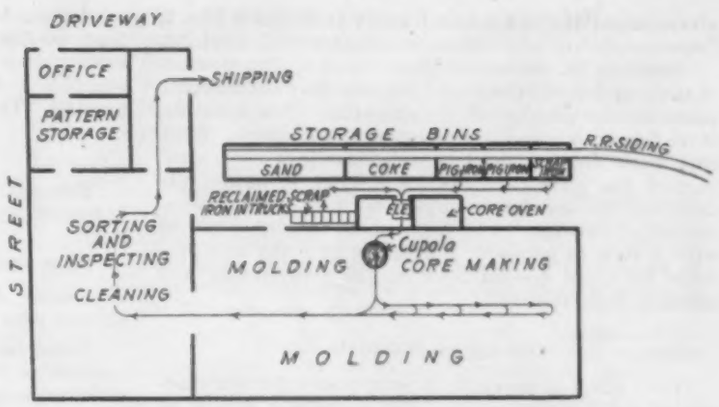


Fig. 3 (Above) Layout of a Jobbing Foundry Employing 90 Men

these plants and the difficulty of the tasks imposed, due to lack of labor-saving devices, caused laborers to choose more desirable jobs.

Several plants were operating in cramped quarters. The prices on adjacent properties prohibited purchasing them for additions to the foundry. A sale of the foundry property would no doubt in some cases net a price sufficient to secure a more suitable location and to erect a plant more advantageous from the production standpoint.

Building Layouts for Uniflow Production

Provision for continuous flow of materials from the raw materials receiving yard, through production departments, to the shipping room door, is the observed trend of present day foundry layout. Fig. 2 is an example of uniflow production. The foundry illustrated is occupied entirely with production work. Castings from a few ounces in weight to cylinder blocks for 6-cylinder motors is the range of work. Four of the five bays are given over to molding. Each bay has a given class of work, varying from small squeezer work in Bay No. 1 to the output of the tractor sandslinger which occupies Bay No. 3.

Raw materials are delivered to the storage shed at one end of the foundry. From the storage pile the materials proceed, without retracing, through the cupola, the molding floor, the cleaning room, the inspection and shipping departments. This arrangement minimizes material handling. It eliminates crowded and confused conditions in the foundry. It facilitates production and promotes safe working conditions.

This is the first of a series of ten descriptive studies of management practices in the foundry, made by the Metropolitan Life Insurance Co., New York, through its policyholders' service bureau. The general title is "Better Foundry Practice."

Fifty-four foundries located in various parts of the United States were visited and careful observations made of plant, organization and management practices. From these observations have been assembled examples of methods in use which have resulted in better operations, improved working conditions and reduced costs.

The studies on which the articles are based were made by two technically trained men who have had production and sales experience since leaving college. Both were connected with technical matters in the United States Army during the World War.

Greater Production Without Plant Increase

The layout of a jobbing foundry employing 90 men is shown in Fig. 3. This arrangement is the result of a study made to meet the needs of greater production without increase of plant. There is but one section of the plant (at right of cupola) where metal is carried in for pouring and carried out after casting. Otherwise, there is a continuous flow from the storage bins to the shipping room door.

Fig. 4 is a layout which involves the traveling back of the metal from every section of the foundry. This plant—a jobbing foundry turning out large castings—has a daily capacity of 30 tons. Perhaps the answer to this management's complaint of heavy turnover of labor, high costs and low output, lies to a large measure in the layout of the plant and the resulting working conditions.

The relationship of the several departments of a jobbing foundry is shown in Fig. 3. The departmental

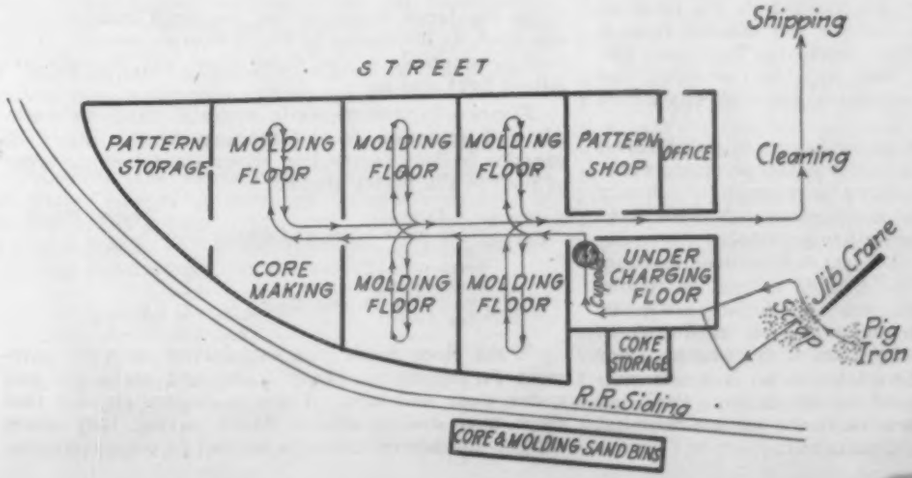


Fig. 4—Layout Involving Traveling Back of the Metal from Every Section of the Foundry

arrangement of a production foundry is shown in Fig. 2. Departments are laid out to minimize material handling.

Practices in individual plants vary. The product of the foundry and the building layout play considerable parts in the placing of departments. For example, stove foundries give little attention to core work. What core work there is can be carried out in a convenient part of the plant. On the other hand, in automobile foundries the core room plays a big part in the manufacture of castings. This department usually is placed with a view to minimizing handling of cores and provides for close contact between the core-making and molding departments.

Storage of Materials

Yard space is provided in most plants for the storage of pig iron and scrap. Fig. 3 shows a system of bins with a railroad siding elevated over them. Hopper dump or side dump cars are readily unloaded into these bins, thus eliminating considerable material handling. An industrial railway serves the bins and affords direct transit of materials to the cupola elevator.

In the foundry shown in Fig. 2 materials are stored in a covered storage shed. Pig iron is stored by lot, as determined by analysis. Coke is piled, as received, in the section marked. In several plants care was taken to reduce breakage of coke to a minimum. A short drop was arranged or a slide provided to guide the coke.

Sand storage bins protected from the weather were provided in twenty-nine of the plants visited. The life of sand stored in the open is shortened and the sand is weakened.

Several plants using wood flasks had sheds for their protection against weather conditions. At one plant large iron flasks were piled outside the building at the end of the molding floor in which they were used. An extension of the crane-way gave ready access to the flasks and minimized handling.

Managers who fully realize the importance of preserving patterns provide a separate fireproof storage with adequate space and a workable system. Pattern storage practice forms the subject of a separate pamphlet.

Productive Departments

Modern core rooms, located where light and air are abundant, offer a decided contrast to the dingy core room of the past. Each coremaker is provided adequate space in which to work. Transportation of completed cores to finished core storage or to the molders eliminates congestion in the core room. Core ovens are erected and placed to reduce employee hazards. Installation of ventilating hoods and provisions for removal of heat have been pretty generally adopted.

As a rule, set-off sections of a plant are used for housing the cleaning department. The noise and in many cases the dust resulting from operation of mills necessitate this isolation. Proximity to the molding department simplifies transportation of castings.

One plant manufacturing small castings made a direct connection between the cleaning and the inspection departments. Castings, finished in the cleaning room, were placed on a conveyor and dumped from it onto the inspector's bench. Boxes for individual lots of castings were placed close by. As inspection was made, placement in the proper box automatically sorted the castings.

Bench molding in a foundry having high individual production is laid out to give the molder adequate working space and good working surroundings. Ready access to tools, room to move about, adequate light and an individual work place are provided.

When work of different sizes, such as floor molding, bench molding and pit molding, is carried on in one plant, sectional divisions of the plant usually are made. Material handling requirements play a large part in the selection of the suited portion of the foundry. For example, proximity to the molten metal is a determining factor in the location of the pit section. Provision of sufficient working space, light and air are essential in the layout of molding departments.

Several large plants operating sand conveying systems use the basement of the foundry for storing and conditioning sand. The foundry of an automobile plant occupies a 6-story building and employs continuous pouring. The departmental layout is as follows:

Multi-Story Foundry

Basement.—Sand, as shaken out, is delivered to the basement, reconditioned and returned to the molding floor.

First Floor.—Molding floor. Cleaning room.

Second Floor.—Core making department. Continuous core ovens lead up to the third floor.

Third Floor.—Core sand mixing floor. Continuous core ovens. Mixed core sand is dropped through pipes to core makers' benches on the floor below. Core assembly.

Fourth Floor.—Machine shop for maintenance and manufacture of metal patterns. Stock room for repair parts.

Fifth Floor.—Pattern shop. Pattern storage.

Sixth Floor.—Brass and aluminum foundry.

Building Construction

Buildings constructed to house the several departments of the foundry most advantageously are designed with a view to working conditions resulting from the type of construction adopted. The more recent foundries are built to provide the workman with adequate heat, light and air as aids in facilitating production. The installation of a heating system or the alteration of the roof or walls to provide more light and air are improvements made in older buildings to give the workmen better surroundings.

Materials of Construction.—Data gathered from the survey of 54 foundries show the number constructed of the materials listed:

Material	Number of Buildings
Brick and steel	19
Brick	9
Brick and wood	23
Wood	2
Stone	1

Side walls with a large glass area are typical features of new construction. Fig. 5 is a cross-section of this type of construction, which is suited to the foundry housed in a long, narrow building. It is a typical brick and steel building. It will be noted how readily adequate ventilation is supplied. Air enters through the openings at the left, above the workers' heads, then drops to replace heated, smoke-laden air, which rises rapidly and flows out through the openings on the right.

Type of Roof.—Roofs of plants studied were of the following types:

Type	Number of Plants
Monitor	27
Saw-tooth	4
Improved monitor (M)	5
Miscellaneous (flat, pitched, etc.)	18

In the large foundries the improved monitor roof was used, as illustrated in Fig. 6 in cross-section. This roof is adaptable to the wider plant and provides excellent light and air.

Floors.—Improvements in material handling methods call attention to the foundry floor. Study of practice in floor cnstruction shows the following types of floor in the plants studied:

Type	Number Found
Wood block aisles and cement floor	1
Cement floor	9
Brick floor	1
Iron plates for aisles	3
Cement aisles, clay floor	3
Clay floor	37

Wood block floors give satisfaction as aisle pavement for conveying heavy loads, and stand up well under wear and tear. Three managers claimed that their men dislike cement floors, saying they cause fatigue and are injurious to health. In some instances,

cement aisles and clay working floors are combined. The leveling of uneven clay floors will promote safety and facilitate the movement of wheelbarrows or trucks about the foundry floor.

Foundry Lighting

Lighting conditions in foundries visited varied. A comparative statement on lighting conditions found follows:

Condition (Under either artificial or natural light, or both)	Number
Good	26
Fair	9
Poor	19

In touching up a mold the workman should be able to see uneven places on the inner surfaces or openings in the mold, as well as on the outside. Unless attention is given to minimizing shadow effect, the chances are that these openings will be in shadow, in which case the work is trying and often impossible.

The amount of dust in the foundry presents additional difficulties in installing and maintaining a lighting system. A film of dust on the lamp or reflector will materially decrease the effectiveness of the lamp. Immediate replacement of burned-out lamps and fuses is a necessary part in maintaining a proper lighting system.

One of the foundries visited will illustrate the factors contributing to the proper illumination of a plant. The "odd-job" man about the plant was made the maintenance department. The plant employed 75 molders on medium size work. The building was an old structure.

Among the various duties of the maintenance department was the upkeep of the natural and artificial lighting of the plant. Periodic whitewashing of walls, washing of windows in walls and in monitor, cleaning of electric lamps and reflectors, and replacement of burned-out lamps and fuses kept the maintenance department busy. Lighting conditions within the plant were ideal. This little attention given at a relatively low cost paid the management dividends in contentment of workers. In reply to the question on personnel turnover, the management reported "practically none."

Necessity for placing molding departments and core rooms in well-lighted locations is receiving considerable recognition. However, many plants still neglect this practice. A glance at some core rooms shows the lack of consideration by some managers of the benefits derived from adequately lighted shops.

Methods of Heating Plants

Protecting the comfort and health of workmen in the winter months by providing a warm workplace is the practice in a number of plants. Some idea of prevailing methods of heating foundries is given in the following data taken from the survey:

Method of Heating	Number of Plants Using System
Air conditioned	5
Hot air	18
Stoves	7
Steam	2
Hot water	1
No special heating arrangement	21

Special heating arrangements are appropriate, particularly in plants where continuous molding is not employed. Starting the cupola usually takes place toward the close of the molding period. If a foundry depends on the cupola and the molten metal for heat, its workmen will suffer in cold weather during molding periods.

Ventilation of Plant

While construction in many cases provides adequate natural ventilation, very wide buildings and older structures accumulate gases and dust, unless additional ventilation is provided. A summary of the means of ventilating applied to the plant as a whole is given in the following survey data:

Ventilation Systems	Number of Plants Using System
Natural (provided by plant construction)	20
Artificial system (air conditioned)	5
Simple blower system	3
No special provision (construction inadequate for proper ventilation)	21

A large plant using the truss formation of Fig. 6 in multiple required ventilation additional to natural. Ducts of the air system installed removed smoke—the completeness of the process was shown by the clearness of the air in the entire foundry. Core ovens, cleaning mills and sandblast rooms are points in the foundry which receive attention in regard to providing proper ventilation.

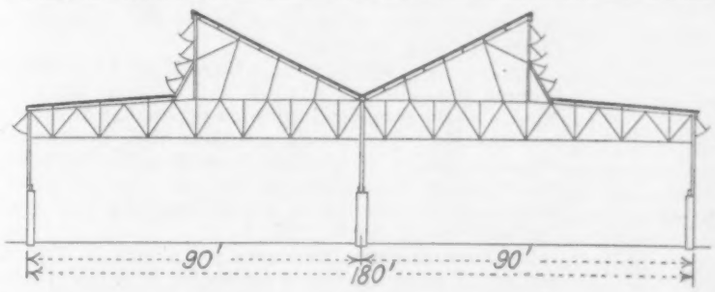
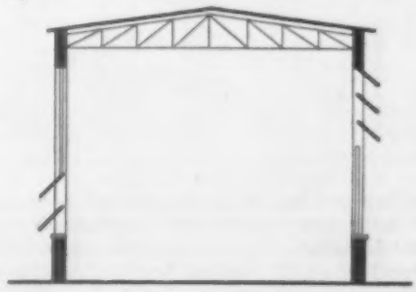


Fig. 6 (Left) Improved Monitor Roof

Fig. 5 (Below) Cross-Section of New Construction



Leaks in ducts attached to cleaning mills render the cleaning room an unhealthy workplace. One plant visited had, in addition to faulty ventilation of cleaning mills, a makeshift sandblast room which leaked sand and dust into the adjacent cleaning room. This room was continually clouded during operation. Heavy turnover of cleaning room labor was reported by the management.

It is interesting to note the amount of attention given to efforts to maintain proper conditions in the foundry building. Some plants give this special attention, while others are prone to concentrate all attention on molding. It was possible to note a difference in the worker from the standpoint of personnel turnover as well as output of work and working morale, in going from plant to plant. At well-kept plants better workers are found, with resulting better output.

Employees of the General Motors Corporation and its subsidiaries are offered the right to subscribe to the company's 7 per cent preferred stock in amounts from one share to 10, depending on the employee's wages. As an inducement to employees to remain with the corporation an extra payment of $2 yearly for five years will be made in addition to the regular dividend.

Oxygen and the Red Shortness of Steel

German Investigation of the Effect of Gases on Rolling Qualities—Low-Carbon Basic Open-Hearth Practice in Germany

THE following article is abstracted in considerable detail from a paper by Dr. H. Monden in *Stahl und Eisen*, June 7 and 14, 1923. The principal object of his work was to study the influence of oxygen and gases in steel on its rolling qualities and red shortness, but it also gives a good deal of insight into German methods of making low-carbon basic open-hearth steel. The work was not done on a laboratory scale but consists of careful observations on 10 heats of steel made under regular plant conditions at the Falvahütte in Upper Silesia.

The opening part of the paper discusses the widespread opinion among practical men that steel must be thoroughly and carefully deoxidized in order to avoid poor rolling and defects in the finished material. This general belief is not supported by results or reports of tests but is based on experience. There is little scientific literature on the subject because the experimental difficulties are considerable. The author discusses this literature briefly and points out that it does not lead to any uniform conclusions. The method for determining oxygen in his samples is that of Ledebur, improved by Oberhoffer, consisting in principle of reduction of the oxides in the steel by a stream of hydrogen and determination of the water produced.

Table 1.—Analyses of the Heats

Heat		Car.	Man.	Phos.	Sul.	Sil.	Cu.
1	a	0.09	0.47	0.048	0.024	n. d.	0.19
	b	0.14	0.51	0.075	0.048	n. d.	0.23
2	a	0.15	0.30	0.015	0.016	n. d.	0.18
	b	0.15	0.34	0.020	0.030	n. d.	0.24
3	a	0.13	0.49	0.046	0.017	n. d.	0.14
	b	0.16	0.53	0.050	0.027	n. d.	0.15
4	a	0.08	0.31	0.011	0.025	n. d.	0.14
	b	0.08	0.32	0.025	0.026	n. d.	0.16
5	a	0.16	0.30	0.016	0.018	n. d.	0.17
	b	0.15	0.29	0.020	0.024	0.13	0.15
6	a	0.13	0.31	0.019	0.020	n. d.	0.16
	b	0.14	0.30	0.017	0.046	n. d.	0.17
7	a	0.16	0.33	0.012	0.016	n. d.	0.15
	b	0.16	0.35	0.024	0.029	n. d.	0.16
8	a	0.26	0.43	0.045	0.034	n. d.	0.17
	b	0.26	0.42	0.045	0.040	n. d.	0.18
9	a	0.06	0.30	0.018	0.030	n. d.	0.192
	b	0.095	0.28	0.022	0.058	n. d.	0.20
10	a	0.10	0.53	0.032	0.031	n. d.	0.676
	b	0.14	0.51	0.052	0.050	n. d.	0.70

The 10 heats chosen for the tests were followed from beginning to end. They were made in the Falvahütte plant, 8 of them in 40-ton furnaces and 2 in a furnace of about 20 tons capacity. The steel was bottom poured in molds 6¾-in. square at the bottom, 5⅛ in. at the top and about 63 in. long. From each heat one test ingot was chosen and the resulting 10 ingots were rolled together to 30 mm. (1.18 in.) squares. The material for the physical and metallographic testing was taken from these bars. The analysis of the heats is given in Table 1, the first analysis "a" in each case being from chips taken while machining a section from the butt of each ingot as explained later, the other analysis "b" being from the usual ladle test ingot taken about the middle of each heat. The silicon was undetermined except in one case, but in the diagrams is shown as being extremely low.

In general it will be noticed there is good agreement between the ladle test analysis and material from the ingot, also the comparatively high percentage of copper is noticeable. The article mentions that samples of metal and slag were taken while working the heats but unfortunately the results of analysis are not given. Details of the open-hearth practice and the rolling of the ingots are given in Table 2.

Sections through the ingots are shown in Fig. 1, and are of great interest in connection with the results of rolling given in Table 2. In the paper is given a table of rolling times and temperatures. Only one case of ingot temperature is given, which was 1333 deg. C. (2350 deg. Fahr.) for Heat No. 10. Many cases are given before the last finishing pass, ranging from 917 to 950 deg. C. (1682 to 1742 deg. Fahr.), and a few cases after the last pass 895 to 907 deg. C. (1642 to 1664 deg. Fahr.). The results of macroetching of the rolled bars are shown in Fig. 2. Average physical test results on the bars as rolled and after annealing for 6 hr. at 900 to 950 deg. C. are given in Table 3. (The method of cooling is not given, but it was probably in the air.)

The very interesting results of gas analyses on chips from the ingots are shown in Table 4, both in regard to amount and per cent by volume. The chips were taken over the whole cross section of the ingot while machining a piece from the butt 2⅜ in. thick. The method used was that of Oberhoffer and Beutell. It is instructive to compare the column of total gas per gram

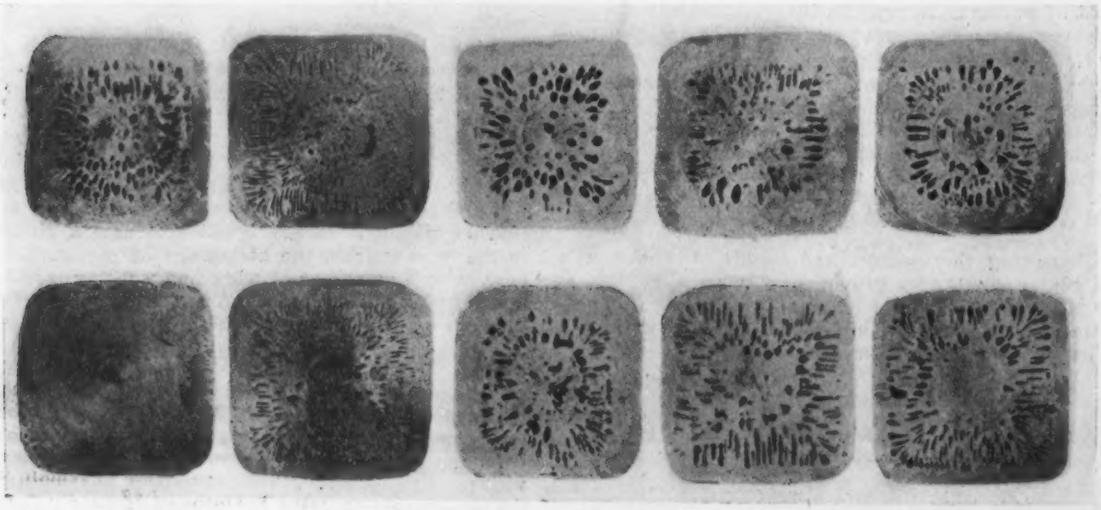


Fig. 1.—Sections Through the Ingots. No. 1 ingot is the first at the left in the upper row with No. 6 the first at the left in the second row, the others following in order

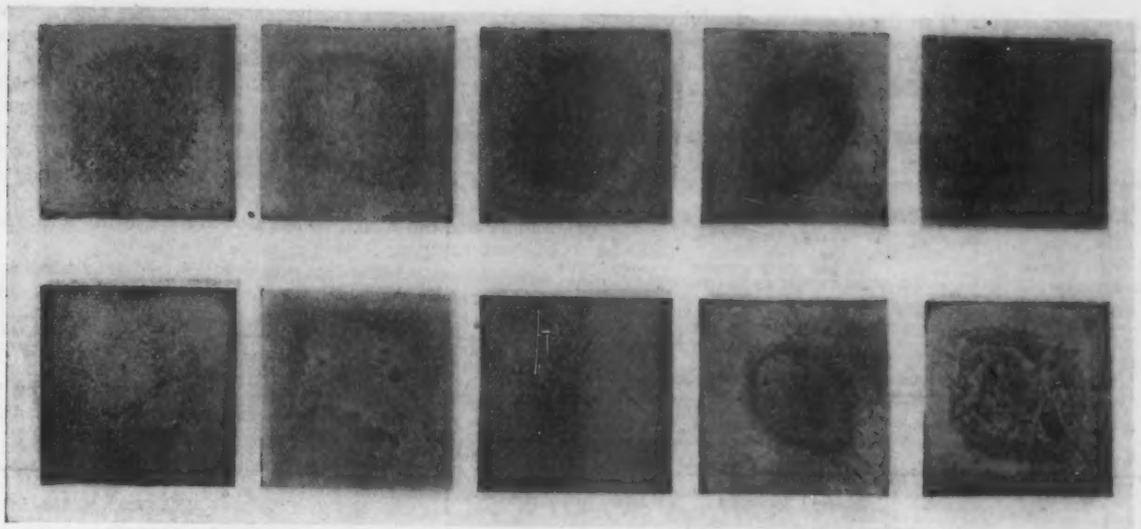


Fig. 2.—Macroscopic Prints of Rolled Bars

of steel with the cross sections of the ingots in Fig. 1; and also very instructive to see how carbon monoxide and hydrogen predominate in the gases present.

In regard to oxygen determinations four different series of tests on the ingots and on the rolled bars gave such great variations in results that the whole test plan appeared to be ruined. In the course of the tests a suspicion arose that the method of taking the test samples had a greater influence than had been thought. It was noticed that during the taking of drillings there was always a small part of very fine drillings as well as the coarser ones. These fine particles usually escaped being included in the sample for analysis. In order to make provision for this a new series of tests was carried out on the following basis. Drillings were taken right through the section of the rolled bars using a 10-mm. drill (slightly over ⅜ in.) with as little feed as possible. The drillings were separated by a sieve of 225 mesh per sq. cm. (about 40 mesh per in.) into fine and coarse, oxygen run on each kind and a careful average worked out based on the weights of both kinds. These results are given in Table 5 and were used as a satisfactory basis for the further work.

These oxygen determinations do not show any direct relationship to the physical test results. They were next considered in relation to the steel making practice. The heats with low values for oxygen, that is from 0.050 to 0.060 per cent were found to have new clean scrap charges of approximately 60 per cent and more, with old scrap considerably less than 20 per cent. All heats, on the other hand, with oxygen of 0.070 to 0.085 per cent show an old scrap charge of 35 per cent and over.

When it is considered that the heats are distributed over a long time and were subject to many varying operating conditions there is no escaping the conclusion that the chief factor influencing the oxygen content of soft basic open-hearth steel is in the kind and amount of scrap, and it would appear that oxygen is chiefly introduced into the steel by old rusty scrap.

The heats should be considered from this basis. Heat No. 4 has the lowest oxygen with 0.05 per cent. It has also the best charge in regard to scrap in that almost 65 per cent consisted of new steel ingots, that is, new clean scrap. Heat No. 8 has indeed more clean scrap, namely 66.5 per cent, but only 57 per cent new ingots were used which contained 0.094 per cent oxygen while Heat No. 4 used ingots containing only 0.066 per cent oxygen. The liquid pig iron used for Heat No. 4 had 0.145 per cent oxygen (13.2 per cent of the charge). The rest of the charge consisted of 4.6 per cent spiegel and 17 per cent of baled light scrap.

How far the oxygen content of the charge has been influenced by the last two cannot be said but certainly it has not been reduced. It can be safely estimated that the charge contained 0.08 per cent and the finished material has 0.05 per cent, so that in the open-hearth there is a reduction of oxygen present in the charge as contrasted with the basic Bessemer process. The same tendency is seen in Heat No. 2, for the charge contains at least 0.12 per cent oxygen, as judged from determinations on coarse drillings only, while the finished steel shows a reduction of more than 50 per cent.

The influence of the oxidizing power of the furnace gases is probably of importance, for during the melting down stage especially there is abundant opportunity to form oxide of iron. Also during the melting and working there is still absorption of oxygen from the furnace gases. If the influence of the gases is of considerable importance, then the heats with longer times should

Table 2.—Details of Open-Hearth Practice and Rolling of the Ingots

	Times of Heats				Charge								Additions			
	Cold Charging,	Melting, Hr.	Working, Min.	Total,	Pig Iron, Per Cent	Pig Iron, Kind	New Scrap, Per Cent	New Scrap, Kind	Large Old Scrap, Per Cent	Turnings, Per Cent	Baled Light Sheet, Per Cent	30 Per Cent FeMn, Per Cent	75 Per Cent FeSi, Per Cent	Special	Rolling of Ingots
1	3.20	2.10	4.05	9.35	43.56 3.98	liquid spiegel					52.10	0.36			
2	2.00	3.40	1.40	7.20	23.2 5.53	cold liquid	59.3	ingots	11.3			0.68			Cracked in middle
3	2.15	3.25	2.32	8.13	20.75 4.62 4.62	cold molds spiegel	35.6 22.4	shells foundry			11.55	0.46			No cracks
4	2.30	3.40	2.03	8.13	13.19 4.63	liquid spiegel	64.74	ingots			16.98	0.46			Many large and small cracks
5	1.20	4.10	5.00	10.30	34.2	liquid	43.24 8.5	ingots mill	8.5		4.20	0.42	0.34		Perfectly free from cracks
6	4.15	4.40	2.06	11.01	20.7 6.55 6.55	liquid solid molds			44.7			0.50		15 shovels electrode carbon	Much cracking in upper third
7	2.00		5.12	7.12	10.3 25.29	cold liquid	29.7	mill + foundry	34.5			0.21		660 lb. carburite	Some cracks in upper third
8	2.20	3.00	2.18	7.38	28.25	cold	57.0 9.6	ingots foundry			4.3	0.35			Small cracks in lower third
9	2.00	3.05	3.35	8.40	none		60.4	mill	36.6			3.00			Many large cracks
10	2.55	3.55	3.40	10.30	none				20.8	77.5		1.7			Many bad cracks upper third

show more oxygen than the others. A careful comparison of the heats does not show this, and the only conclusion to draw is that the oxygen content of the finished steel is not influenced to an important extent by the furnace gases.

The next question taken up was the influence of the oxygen, as determined by the Oberhoffer process, on the red shortness and the rolling properties. Tests for red shortness were carried out as follows. In the first series pieces 300 mm. long (11-13/16 in.) of the 30 mm. sq. bars (1.18 in.) were used. These were nicked in the middle with a specially prepared chisel that went just to the center of the bar. Another series was carried out on bars of the same size nicked to only one-sixth of the bar section.

Table 3.—Physical Test Results of Bars as Rolled

Heat	Elastic Limit, Lb. per Sq. in.	Ultimate Stress, Lb. per Sq. in.	Elon. Per Cent in 3.94 In.	Red. of Area, Per Cent
1. As rolled	38,970	60,305	25.05	53.05
Annealed	41,460	57,390	28.2	61.85
2. As rolled	37,690	56,890	29.95	61.20
Annealed	36,200	52,980	29.8	65.3
3. As rolled	36,695	61,370	27.95	59.40
Annealed	32,780	57,740	29.75	62.6
4. As rolled	30,865	49,920	32.35	67.5
Annealed	33,000	49,140	34.55	71.95
5. As rolled	34,360	56,320	28.85	65.55
Annealed	34,560	54,830	32.65	67.65
6. As rolled	33,920	55,400	30.7	58.55
Annealed	35,770	51,000	33.0	65.3
7. As rolled	32,640	56,040	29.7	61.05
Annealed	34,700	53,480	29.9	61.8
8. As rolled	39,750	68,620	23.55	45.25
Annealed	37,690	67,410	22.75	49.8
9. As rolled	34,490	51,344	30.7	64.5
Annealed	33,000	49,640	32.0	69.85
10. As rolled	45,300	64,000	23.25	51.45
Annealed	42,530	62,010	29.2	59.95

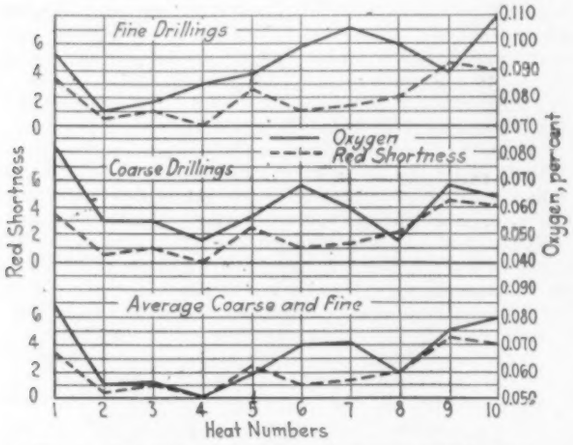


Fig. 3.—The Relation Between Oxygen and Red Shortness Plotted for the Various Kinds of Drillings

Fig. 2 is of interest in connection with the depth of nicking. Tests were carried out at various temperatures by dipping the test bars in a lead bath at the proper temperature for about 10 min. Then as quickly as possible the bars were placed on an anvil, nicked, and bent to 180 deg. For the first series the temperatures chosen were 700, 900, 1050 and 1200 deg. C. For the second 700 and 900 deg. C. The exact temperatures are given in the original paper for each test bar, and agree closely with those desired. Photographs are also given of the bend tests which are not very clear and would be hard to reproduce. The behavior of the bars of the first test varies greatly. In general the red-shortness declines with increasing temperature, but in very different amounts. While Heat No. 4 in general shows no fracture, Heat No. 9 is very red short at all temperatures. Heat No. 1 is very brittle at 700 deg. but loses this with increasing temperature and at 1200 deg. is completely free from brittleness. The same is true for Heat No. 10, which at 700 deg. is so red short that it breaks in two, but loses it at the next higher temperature, 900 deg.

The behavior of the bars is similar in test series No. 2, but with the fundamental difference that at 900 deg. all bars are completely free from red shortness, and at 700 deg. the red shortness, though it appears, is only very little. If the oxygen results are now compared with the red shortness determined in this way the following is the result. Both heats which show the least red shortness have the lowest oxygen, Nos. 2 and 4. This is most striking in the first series heated to 700 deg. With the series at 900 deg. only heats 1, 9 and 10 are red short, which also are the heats with the highest oxygen.

In order to bring this out clearly a red short number was worked out. Six bars were taken from each heat.

Table 4.—Gas Found in Chips from the Ingots

Heat	Test	Cc. per 100 Gm. Material: CO	H_2	CO_2	N_2	Total	Volume, Per Cent: CO	H_2	CO_2	N_2
1	1a	44.25	13.87	2.77	3.57	64.46	70.02	21.94	4.39	5.65
	1b	39.55	12.15	2.12	2.68	56.5	70.00	21.50	3.75	4.75
	Av.	41.90	13.01	2.44	3.12	59.85	70.01	21.72	4.07	5.20
2	2a	49.04	10.29	3.31	2.06	64.7	75.80	15.90	5.12	3.18
	2b	48.83	12.15	3.32	1.50	65.8	74.20	18.46	5.06	2.28
	Av.	48.93	11.22	3.31	1.78	65.25	75.00	17.18	5.09	2.78
3	3	37.24	13.30	2.33	3.13	56.00	66.50	23.75	4.16	3.59
4	4a	31.90	8.34	2.67	3.80	46.7	68.30	17.85	5.71	8.14
	4b	33.24	9.35	2.66	3.94	48.7	68.25	19.20	5.46	8.09
	Av.	32.57	8.84	2.66	3.87	47.7	68.27	18.52	5.58	8.11
5	5a	6.78	8.98	0.50	0.37	16.63	40.80	54.00	3.00	2.20
	5b	7.03	8.73	0.52	0.52	16.80	41.80	52.00	3.10	3.10
	Av.	6.91	8.85	0.51	0.44	16.71	41.30	53.00	3.05	2.65
6	6a	59.64	14.62	2.99	5.45	82.70	72.10	17.70	3.61	6.59
	6b	55.75	13.86	2.20	1.54	73.35	76.00	18.90	3.00	2.10
	Av.	57.69	14.24	2.59	3.49	78.02	74.05	18.30	3.30	4.34
7	7a	42.44	11.21	2.50	1.35	57.50	73.80	19.50	4.35	2.35
	7b	37.17	12.90	1.07	0.86	52.00	71.50	24.80	2.05	1.65
	Av.	39.80	12.05	1.78	1.10	54.75	72.65	22.15	3.20	2.00
8	8a	50.95	31.81	4.65	6.59	94.00	54.20	33.84	4.95	7.01
	8b	55.96	26.93	3.98	5.63	92.50	60.50	29.11	4.30	6.09
	Av.	53.44	29.37	4.31	6.11	93.25	57.35	31.47	4.62	6.55
9	9a	21.72	11.00	1.32	0.63	35.00	62.05	31.40	3.76	1.79
	9b	21.78	9.16	1.74	0.72	33.40	65.21	27.40	5.22	2.17
	Av.	21.75	10.08	1.53	0.67	34.20	63.63	29.40	4.49	1.98
10	10a	41.66	7.23	2.49	2.02	53.40	78.00	13.54	4.67	3.79
	10b					48.60				
	Av.					51.00				

If all six show no brittleness the number is 6, if all show it the number is 0. The cases between are graded accordingly and the results are plotted with the oxygen in Fig. 3. There is seen to be good agreement except in the cases of Heats 6 and 7. The reason for the disagreement with these two heats cannot be determined with certainty. In both cases an addition of solid carbon electrode scrap was given shortly before tapping. The high copper, 0.67 per cent, of Heat No. 10 does not appear greatly to influence the red shortness.

On the whole it can be said that the red shortness of basic open-hearth steel is in direct relation to the oxygen content as determined by the Oberhoffer process.

Table 5.—Oxygen Results and Red Short Values on Rolled Bars

Heat	Oxygen: Fine Drillings, Per Cent	Coarse Drillings, Per Cent	Average, Per Cent	Red Short Values
1	0.096	0.082	0.084	3½
2	0.075	0.054	0.055	½
3	0.078	0.054	0.056	1
4	0.084	0.048	0.050	0
5	0.088	0.056	0.059	2½
6	0.098	0.069	0.070	1
7	0.106	0.060	0.071	1¼
8	0.100	0.048	0.060	2
9	0.090	0.068	0.075	4½
10	0.110	0.064	0.079	4

The author then goes into details regarding the best method of taking drillings and carrying out the Oberhoffer process.

The results of rolling show the ingots of Heats 3 and 5 to be the best, because no cracks develop. From the red shortness tests it would have been expected that No. 4 would be the best, and No. 9 the worst. As a matter of fact Nos. 4 and 9 roll about the same. The results of rolling agree with other experience that the amount and distribution of blow holes are the main factors, and a comparison of Fig. 1 with the last column of Table 2 is of great interest. G. B. W.

Fabricators Adopt Standard Practice Code

Uniform Cost Finding, More Aggressive Selling and Research Work Are Topics Discussed at Convention at French Lick Springs, Ind.

"ONE of the principal needs of the structural steel industry is a market large enough to engage the capacity of our plants." This statement made in an address by President J. L. Kimbrough sounded the keynote of the annual meeting of the American Institute of Steel Construction held at French Lick, Ind., Nov. 13, 14 and 15.

"If we are to maintain satisfactory output," he said, "there is only one way to do it and that is by increasing the use of structural steel through cooperative effort. This can be accomplished by increasing the tonnage consumed in existing markets and by the aggressive and profitable development of new uses. To bring this about is a responsibility the industry as a whole should assume."

It is, of course, one thing to recognize a need and quite another thing to take effective measures to meet it. The sessions of the institute were ample proof that a comprehensive and practical program has been undertaken and is being successfully worked out.

Association's Achievements Summarized

In outlining the aims and accomplishments of the association, Charles F. Abbott, executive director, stressed the necessity of joint endeavor to the end that success may be achieved. To illustrate the fruits of cooperative effort, he pointed to the institute's standard specification for the design, fabrication and erection of structural steel for buildings, which has won almost universal approval and has been incorporated into the building codes of 25 prominent cities. Limited funds alone have prevented a much wider adoption at this time. The economies effected through the standard specification will be further increased through a code of standard practice which was presented for the first time at this convention and adopted. A preliminary report on cost finding methods was also offered and approved and the board of directors was authorized to take steps to promote the general adoption of a uniform cost system.

On the one hand, Mr. Abbott emphasized, the standard specification and the code of standard practice make possible great savings to the fabricators and the general public, while on the other hand, the introduction of uniform cost methods will tend to make for more intelligent bidding, preventing the losses resulting from figures based on errors, misinformation, omissions and guesses and at the same time giving buyers the benefit of low quotations when accurate cost determinations justify them.

Another undertaking in the field of standardization is the proposed preparation of a handbook or manual, which will contain information and data with regard to shapes, sizes and forms especially adaptable for structural work, and which will eliminate many of the duplications and unnecessary sizes included in some of the present handbooks. The institute's standard manual is also to embrace standard formulas, thereby removing confusion and misunderstanding. Handbooks now in use confine uniform treatment to but one subject, i.e., the allowable loads on beams uniformly loaded and laterally supported. Much of the necessary data for the manual has already been compiled by Lee H. Miller, chief engineer of the institute.

While much can be and has been acccomplished in the direction of standardization and intelligent cost finding, it is also important that fabricators develop an aggressive marketing program, Mr. Abbott said. This implies the pooling of sales ideas to the end that all fabricators may have the benefit of the experience of the entire industry; it means improved sales training methods, and it calls for the launching of a research and educational program which will put effectively before the public the merits of structural steel.

"The institute must build up a structural steel consciousness," asserted Mr. Abbott in bringing home this point. Fabricators do not propose to fight the cement industry, but it is incumbent upon them to make equally comprehensive and aggressive efforts to broadcast the advantages of structural steel. This educational campaign should make itself felt before specifications are drawn; it must reach the layman committee with which rests the final decision regarding the character of construction to be undertaken; it should extend to the technical schools whose graduates will direct the building work of the future. Mr. Abbott cited numerous meetings which he and Mr. Miller had addressed during the year as examples of what may be done on a larger scale in the future in educational work.

That the program of the institute is bearing fruit is indicated by the growth of the membership during the past year. On Nov. 1, 1923, 100 companies were members; on Nov. 15, 1924, the number had been increased to 182. The association's revenues for the coming year are expected to be twice those for 1924, but even so they will represent a small fraction of one per cent of the total investment of fabricating plants. A number of mills, including the Bethlehem Steel Co., the Jones & Laughlin Steel Corporation and the Inland Steel Co., have contributed to the institute, in the belief that its work will benefit them as well as the fabricators.

Explodes Fallacies Regarding Structural Steel

While the institute is primarily concerned with the problems of fabricators, it sees in the attainment of its aims equal benefits for architects, engineers, contractors, mills and the general public. In its educational work it hopes to dispel misconceptions which either prevent the use of structural steel for purposes for which it is best adapted or, when it is used, dictate the employment of improper design. That much can be accomplished in this field was indicated by an address on the "Basic Principles to be Considered in Fireproofing Structural Steel." The speaker, A. W. Sinnamon, member Engineering Institute of Canada, and mechanical engineer of Hubbell & Benes, architects, Cleveland, asserted that contrary to the general belief that steel loses its strength as temperature increases, it actually gains strength within certain limits.

"Within the range of temperatures developed by ordinary fires and certainly within the range of temperatures applying to the steel in a properly designed building even under maximum fire conditions, the strength of the steel is entirely adequate," he said. He presented graphs showing the relation between increases in temperature and strength and expansion.

The principles which should be followed in fireproofing steel were pronounced to be the following:

1. Any heat that reaches a structural steel section in a building should be uniformly distributed over the entire area of the section.

2. The steel members should be free to expand as heat is applied or they should be so protected as to permit but a moderate increase in temperature.

For the distribution of heat there is no material that equals air. Mass, weight and solidity are not the means of securing dependable permanency in building construction. It is not the incombustibility of the materials involved that determines the efficiency of the construction. It is rather the ability of the materials to function for the purpose intended without being destroyed by the resulting stresses from expansion when high temperatures are applied. Plaster on metal lath,

according to the speaker, is a better protective coating for structural steel than clay tile, brick or concrete.

Code of Standard Practice Adopted

Undoubtedly the signal achievement of the convention was the adoption of a code of standard practice, which was presented by the chairman of the sponsor committee, W. M. Wood, Mississippi Valley Structural Steel Co., Decatur, Ill. The code is intended to supplement the institute's standard specification, covering conditions not touched upon in the latter.

"During the 35 years since structural steel was introduced, there has developed an industry engaged in fabricating and erecting this material which is now furnishing more than $300,000,000 worth of products to the public annually. With the development of this great industry many inconsistent practices and definitions have come into being." It was for the purpose of clearing up confusion and eliminating various sources of dispute that the institute undertook to codify the various trade practices with a view to establishing uniform procedure.

An example of one of the many causes of misunderstanding between buyer and seller is the lack of uniformity in classifying the various iron and steel items entering a structure. These have been grouped in the institute's code under four classifications in which the listing is in sufficient detail to prevent any possibility of doubt as to the material to be delivered under contract. The classes are as follows:

Class A—Structural Steel and Iron
Class B—Ornamental Steel and Iron
Class C—Steel Floor Joists
Class D—Miscellaneous Steel and Iron

The classification is just one feature of a number of important matters which are carefully covered in the code. The work of the committee extended over an entire year. Following the completion of the first draft, it was sent out broadcast to engineers, architects, contractors, technical publications and others for criticisms and suggestions. More than 150 replies were received and the code was revised to embody the suggestions which were regarded as pertinent. The revised draft was reviewed by a committee of eight engineers who, in turn, made certain revisions. The resulting draft was again distributed, much in the same manner as the original copy, and was finally reviewed by the institute's board of directors. The final step was the examination of the code from a legal standpoint by two prominent attorneys.

Throughout the code equal consideration is given the interests of buyer and seller. The code clears up definitely the basis of invoice weights. It defines what constitutes a plumb building. On the question of delays it sets up rigid requirements which bind the seller equally with the buyer in every detail, making compensation and adjustments for such delays a matter of simple definite routine and eliminating the loopholes which have proved a source of annoyance to fabricators and purchasers alike.

Supplementing the code is a standard form of proposal, under which the seller agrees to furnish to the buyer certain materials and labor "in accordance with the conditions of the code of standard practice of the American Institute of Steel Construction." Execution of the proposal by buyer and seller is all that is necessary to make the code operative on any contract.

Better Selling Methods Discussed

Improvement in selling methods is one of the principal aims of the institute and for that reason an address on what has been accomplished in an industry which sells through the same channels as the steel fabricators was of especial interest. The three important factors which must be dealt with in the sale of structural steel for buildings are: (1) the architect or engineer who specifies the equipment; (2) the heating contractor who installs the system; (3) the owner who pays the bills. The same factors largely control the purchase of the products of the American Radiator Co., the sales educational plan of which was described by R. C. Hay, manager of sales training.

The secret of the success of the American Radiator Co.'s training plan lies in its practical foundation. Common difficulties in selling, Mr. Hay said, were listed by his organization in the form of a questionnaire which was sent out to all sales representatives. Their replies embodying suggestions as to how these typical problems might be solved have not only formed an excellent basis for the training of new salesmen but have also proved invaluable to the entire sales force. Embodied in a sales manual, the answers to the questionnaire constitute a comprehensive and at the same time eminently practical guide in meeting sales problems. By setting up a clearing house of information the company has made available to each salesman the combined experience of all.

Four principles essential to the success of a sales training program were summarized by Mr. Hay, as follows:

(1) Base your program, your policy and your actual work upon a careful, first-hand study of the conditions in the field at the point of sale.

(2) Have the sales training department serve as a clearing house for the best ideas of the sales organization as to how to deal with the problems which the field study determines to be the most important.

(3) Make specific application of the practical knowledge of the problem and the solution in the training of new salesmen, and in the training of regular salesmen on the job by the branch manager, and in organized classes at sales headquarters.

(4) Utilize the knowledge gained as to the sales problems and the best methods for the solution of these problems in the preparation of sales manuals which will be 100 per cent practical and useful to the salesman day in and day out.

Two fundamental policies underly the sales program of the American Radiator Co. and Mr. Hay commended them to the attention of steel fabricators. First, emphasis is placed upon producing quality products; second, a consistent and persistent advertising campaign has been adhered to in good times and bad.

"This advertising," he said, "has not been confined to the description of the products of the American Radiator Co., but rather has been aimed at developing knowledge of and desire for the benefits of steam and hot water heating on the part of the public. At the same time this advertising effort has served to back up the trade in their selling work, and has been of assistance to the trade in closing heating jobs."

Uniform Principles of Cost Finding

The preliminary report on the "Fundamentals of a Uniform Method of Computing Costs in the Structural Steel Industry" was compiled by the institute's committee on uniform cost accounting in co-operation with the firm of Miller, Franklin, Basset & Co., New York. The study, which was originally prepared for the Iron League of New York, presents a basic cost system in its simplest form. It is pointed out, however, that it is not the purpose of the institute to achieve uniform costs, which obviously are difficult of attainment because conditions within each company vary so widely. Neither is it proposed to introduce uniform methods of cost finding, for it is not important that the detailed methods used by the various companies closely resemble one another. In fact, forms for the gathering of the data needed may be utterly dissimilar. It is proposed, however, to direct the thought of the industry along uniform lines, so that the various members of the institute will travel in a common direction in the collection of their cost information. Once uniform principles of cost finding are adopted and similar reasoning upon cost problems is undertaken, there is little danger that unintelligent competition will continue.

The success achieved by other industries in adopting uniform principles of cost finding was outlined in an address by William R. Basset, president Miller, Franklin, Basset & Co.

Importance of Research Work

The opportunity of structural steel lies not in combating competitive forms of construction but rather in broadcasting its own merits and advantages, said Frank Burton, building commissioner, Detroit, in discussing "Steel Fabrication and Municipal Building Inspection."

Alterations in building codes permitting wider latitude in the use of reinforced concrete have been the natural result of experimental work, particularly in the technical schools. Through fellowships at universities the structural steel industry would assist in building up scientific literature regarding its product and likewise in introducing definiteness . where uncertainty now exists.

The speaker specifically recommended that the institute inaugurate research work to ascertain the resistance of shapes to torsion, the adaptation of electric welding for connecting fabricated members, the proper fireproofing of structural steel, the effect of wind pressure, the reaction of rivets in tension. Present available information on these subjects, he contended, is inadequate. That welding may find wider use may be indicated by experience which came under his observation at Detroit, where connections were welded with apparent success under conditions which precluded riveting. Changes in building codes, Mr. Burton observed, should properly emanate from a national organization like the institute rather than from local material interests and like organizations, which are apt to be guided by selfish motives.

The Right Material for the Right Place

The structural steel industry will attain its aims only if it has the courage to recommend the use of the right material for the right place. This implies not only urging the utilization of structural steel when it is best adapted for a particular purpose, but also recognizing the superiority of other materials for uses to which they are more properly fitted. This thought was advanced by A. E. Crockett, manager bureau of instruction, Jones & Laughlin Steel Corporation, Pittsburgh, in an address on the "Training of the Engineer."

"The development of the American nation rested on the shoulders of the engineers of a previous day and the future also rests with the country's engineers; hence it is imperative that we train the engineers of tomorrow correctly," he asserted.

Engineering courses in technical schools should concentrate on the teaching of the fundamentals to the almost total exclusion of specialization, he contended. "Specialization has no place in a four-year course. The time is all too short for the teaching of fundamentals. If America is to hold its place of leadership among the nations of the world it must produce greater engineers, and the beginning of a good engineer is a thorough grounding in fundamentals. An important part of every engineering course should be four years of instruction in English. A good command of English is imperative if an engineer expects to be able to present the results of his work with convincing force and logic."

Province of Local Associations

The institute, as a national organization, is best adapted to attack problems of nation-wide import, but it remains for local bodies to meet purely local conditions, said R. B. Thomas, executive secretary, Iron League of New York, in an address on the "Local Iron League and What It May Accomplish." Through concerted local action his organization has found remedies for evils existing within its sphere of influence, he asserted. He cited the experience of the Iron League in breaking a strike of hoisting engineers and he related how through checking employees by means of cards it is possible to maintain a high standard of craftsmanship.

Work of the Traffic Committee

Opposition to a proposed advance of 5c. per 100 lb. in the fabrication-in-transit freights west of the Mississippi was recommended by the institute's traffic committee. With reference to the Jones & Laughlin rate case affecting rates on steel from Pittsburgh to Indiana and Illinois points the committee stated that a decision will probably not be reached for six months. That the United States Shipping Board will seek to make operative section 28 of the Jones Act, giving preferential freight rates to exports in American vessels was advanced as an early possibility, although opposed by the committee. In citing its accomplishments in opposing rate increases the committee pointed out that its viewpoint is necessarily national and that local conditions must be handled by individual fabricators or by local groups.

Lower Costs Real Objective of Cost Accounting

"The real objective which we should have in adopting uniform cost accounting is a continuing reduction in costs, a locating of the wastes, an elimination of the extravagances, and improvement of methods," declared John W. O'Leary, vice-president Chicago Trust Co., Chicago, in an address at the annual banquet. "The war with its demand for production without regard to costs and the inflation period following has left us with some bad habits in our thought of the real meaning of cost. When demand was so great that we wouldn't even quote, we took work on a cost plus basis. The resulting price usually included extravagance not justified today and hurtful to the upbuilding of the industry."

Other speakers at the banquet were Alfred Smith, governor of New York, and Elisha Lee, vice-president Pennsylvania Railroad, Pittsburgh. Governor Smith emphasized the importance of organization, pointing out its necessity in politics, church and business. Mr. Lee called attention to the interdependence of the steel and transportation industries. The railroads could not have been developed without cheap steel and cheap steel would not be possible without transportation facilities which permit the assembly of raw materials at convenient points of production.

Officers and Place of Next Meeting

The officers of the Institute remain unchanged for the coming year, J. L. Kimbrough, Indiana Bridge Co., Muncie, Ind., having been reelected president, and W. M. Wood, Mississippi Valley Structural Steel Co., Decatur, Ill., vice-president. Charles F. Abbott continues as executive director with office at New York, and Lee H. Miller as chief engineer with headquarters at Cleveland. The fabricating industry west of the Mississippi River was given recognition through the election of Karl E. Vogel, Omaha Steel Works, Omaha, Neb., as director to succeed T. J. Foster, National Bridge Works, Long Island City, N. Y. The other four directors whose terms had expired were reelected. White Sulphur Springs, W. Va., was selected as the meeting place of the next convention, which will occur in November, 1925.

Steel Manufacturers Honor Veteran Traffic Manager

About 250 railroad men from the Mahoning Valley, Pittsburgh, Cleveland and Buffalo gathered Nov. 13 at a testimonial dinner for D. T. Murray, general manager of the traffic and transportation departments at Youngstown of the New York Central Railroad. The occasion celebrated Mr. Murray's seventieth birthday. He served the New York Central lines 59½ years, and came in close touch during that period with the iron and steel industry at Buffalo and Youngstown. Mr. Murray served nearly 20 years as superintendent of the Franklin division of the New York Central. In spite of his three score and ten years, the company, in appreciation of his loyalty, continued Mr. Murray in his present position.

Harry L. Rownd, vice-president of the Republic Iron & Steel Co., on behalf of those present, presented a smoking table to Mr. Murray. Letters of appreciation were read from James A. Campbell, president, Youngstown Sheet & Tube Co., and from Joseph G. Butler, Jr., veteran steel manufacturer of the Mahoning Valley. Severn P. Ker, president, Sharon Steel Hoop Co., recounted Mr. Murray's service to the steel industry of the Valleys.

T. J. Bray, president, Republic Iron & Steel Co. and Julius Kahn, president, Truscon Steel Co., Youngstown, were among those who sent letters of appreciation. Traffic managers of steel companies at Pittsburgh and Youngstown and railroad executives from all sections of the country attended the dinner.

Percentages Made by Several States

Machine Tools Produced in 1923 and Whence They Came

Detailed Figures of the Bureau of the Census, Subdividing Groups of Machines by Kinds and Showing States Making the Chief Supply

HEAVY increase in the production of machine tools in 1923, as compared with 1921, is reported by the United States Census Bureau. The output of 350 establishments in 1923 is given as $137,206,098, or more than double the $67,729,362 produced by 348 establishments in 1921. The number of wage earners increased from 21,307 to 33,277, and their wages from $25,251,735 to $47,237,658. Average wages per wage earner advanced from $1,185 in 1921 to $1,420 in 1923.

The value added by manufacture increased more rapidly than the total value of products, going up from $43,751,114 to $96,032,896, which is 70.2 per cent of the value of the products. The horsepower used in 1923 was 109,140, while the coal consumed amounted to 173,704 net tons.

Where the Tools Were Made

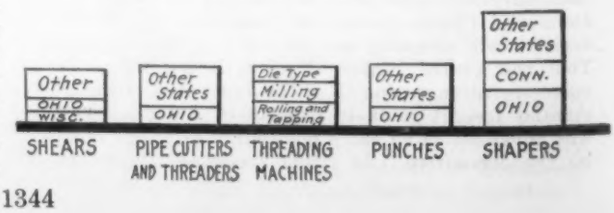
Manufacture of machine tools in 1923 was reported from 20 states, Ohio leading with 95 establishments and production valued at $36,423,371. Pennsylvania, standing sixth in number of establishments with 25, was second in value of products with $12,713,907. Massachusetts, second with 38 establishments, was third in value with $12,361,593. Illinois, third with 30 establishments, was fifth in value with $11,307,749. Connecticut, fifth with 27 establishments, was fourth in value with $11,477,374. New York was seventh both in number of establishments and in value of products, the amount being $10,195,887 from 23 establishments. Rhode Island, standing sixth in value with $10,393,185, was eleventh in number with 10 establishments. Michigan had 29 establishments, being fourth in number. There were 18 establishments in Wisconsin, 13 in Indiana, 13 in New Jersey, and the remaining 28 distributed among nine other states.

Details of Production

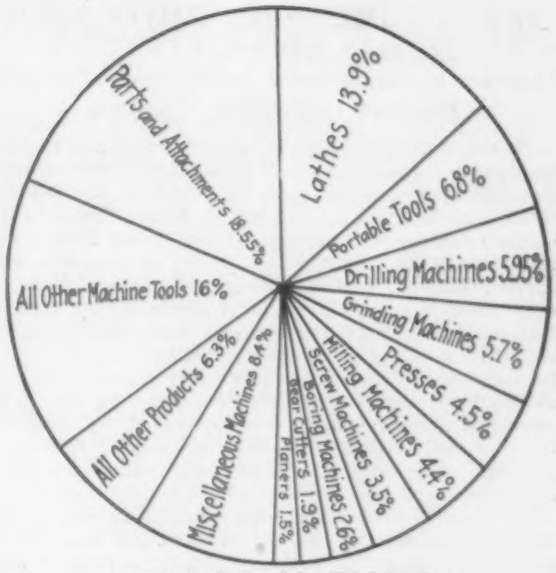
Largest of all groups in 1923 was lathes, with $18,990,485, of which engine lathes accounted for $8,884,904 and turret lathes, including hand screw machines, $5,320,087. Portable tools showed the second largest value, with a total amounting to $9,312,814; electric and pneumatic drilling tools accounted for more than half of this total, with $5,392,626; pneumatic hammers, with $2,842,611, made up the bulk of the remainder. Third in amount were drilling machines (excluding portable) and amounting to $8,140,067, of which multiple spindle machines accounted for $3,431,563 and radial machines for $2,431,268. Fourth in the list were grinding machines, aggregating $7,781,682, of which cylindrical grinding machines accounted for $3,229,061 and surface machines for $2,122,134. Presses with $6,143,820 came next, hydraulic bending and forming presses accounting for $3,697,092, while power presses for sheet metal work showed $2,322,373. The only other group exceeding $5,000,000 was milling machines, with $6,047,225, of which plain power feed milling machines accounted for $1,881,709.

Machine Tool Production in 1923 and Principal States of Supply

	Number	Value
Bending machines	616	$616,443
Illinois	423	173,248
Ohio	92	149,663
Boring machines:		
Horizontal	475	1,209,867
Ohio	114	396,406
Pennsylvania	40	239,316
Vertical	323	2,345,772
Ohio	212	1,381,106
Pennsylvania	35	390,980
Broaching machines	235	347,317
Cutting-off machines:		
Rotary cutter type	299	404,467
Hacksaw type	652	207,873
Drilling machines (except portable):		
Multiple spindle	2,081	3,431,563
Ohio	533	1,018,946
Illinois	579	655,755
Pennsylvania	100	271,115
Radial	922	2,431,268
Ohio	783	2,009,877
Sensitive	2,612	1,228,455
Massachusetts	977	510,596
New York	236	149,438
Upright	2,506	1,048,781
Ohio	1,386	672,354
Illinois	924	210,654
Forging machines:		
Bulldozers	96	711,992
Bolt, nut and rivet	24	100,885
Gear-cutting machines:		
Automatic	453	1,235,428
Generator planing or shaping	390	1,513,594
Generator hobbing type	229	648,589
Formed cutter type	35	106,602
Grinding machines:		
Cylindrical—Plain	1,919	1,715,736
Pennsylvania	228	679,250
Massachusetts	1,036	103,440
Universal	1,672	1,513,325
Massachusetts	1,328	1,001,787
Pennsylvania	90	140,260
Surface	3,789	2,122,134
Massachusetts	3,135	1,570,187
Rhode Island	401	266,190
Connecticut	77	116,061
Cutter, tool and knife	571	404,549
Ohio	155	120,571
Connecticut	55	93,556
Internal	515	888,620
Massachusetts	364	654,750
Other	11,069	1,137,318
Michigan	249	307,832
Connecticut	159	83,998
Hammers (not portable):		
Steam or pneumatic	1,435	585,042
Drop	122	164,220
Power (belt or motor driven)	420	126,466



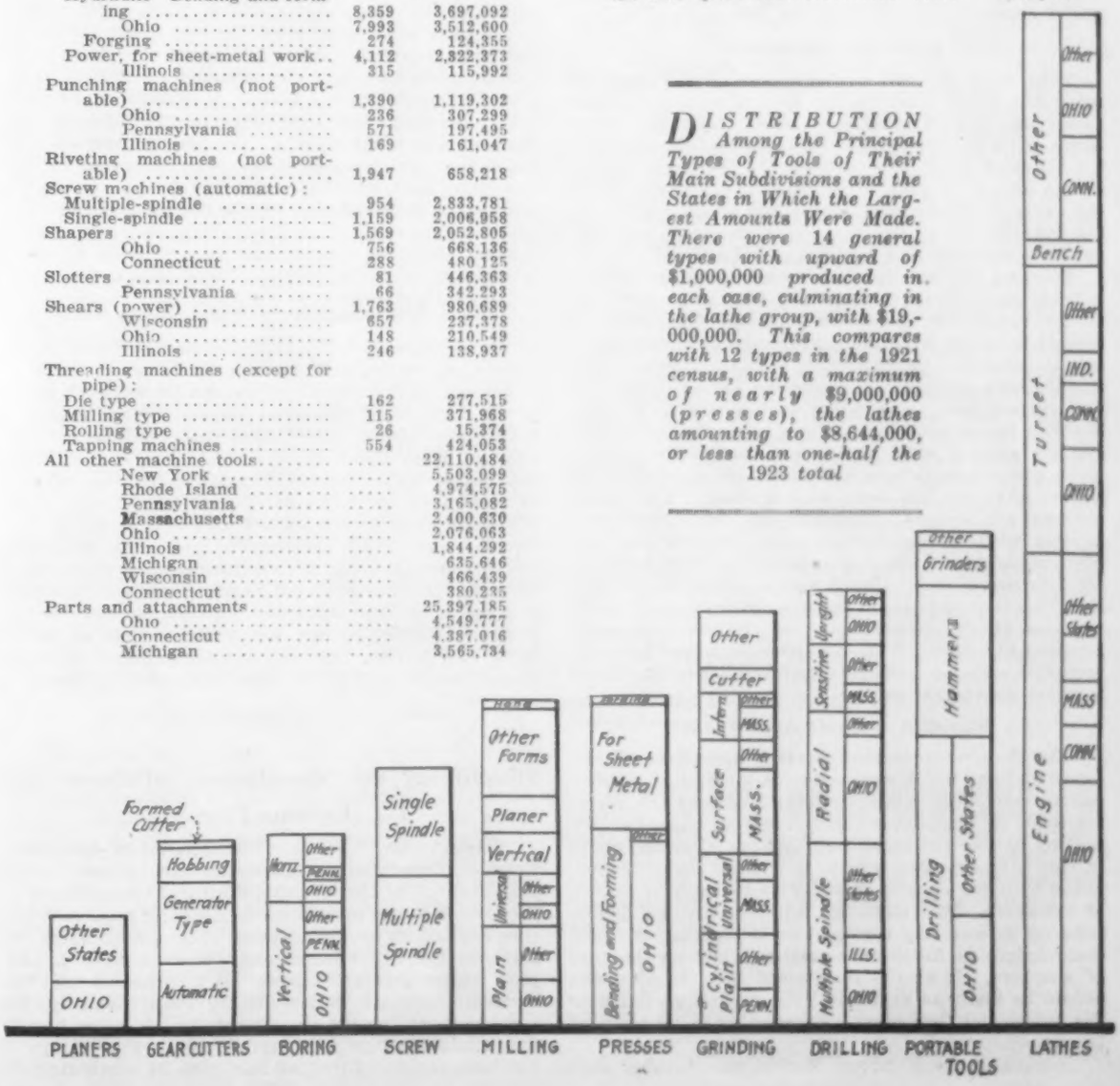
	Number	Value
Lathes:		
Engine	7,295	$8,884,904
Ohio	2,545	4,573,126
Connecticut	684	1,058,893
Massachusetts	893	810,704
New York	493	440,590
Illinois	327	272,409
Bench	950	462,123
Massachusetts	356	124,937
Turret (including hand screw machines)	2,544	5,320,087
Ohio	1,351	1,950,129
Connecticut	318	1,213,086
Indiana	180	550,709
Other	1,197	4,323,371
Connecticut	286	1,954,891
Ohio	290	988,671
Planers	302	2,110,093
Ohio	163	881,434
Pennsylvania	23	171,080
Milling machines:		
Hand feed	274	93,794
Power feed—		
Plain	1,063	1,881,709
Ohio	459	820,412
Universal	453	959,967
Ohio	170	380,075
Vertical	328	770,541
Pennsylvania	22	159,232
Rhode Island	38	108,274
Lincoln type	194	438,950
Planer type	56	672,969
Other	538	1,229,295
Ohio	225	166,509
Pipe-cutting and threading machines	1,958	1,002,497
Ohio	830	319,979
Portable tools:		
Drilling, electric and pneumatic	96,729	5,392,626
Ohio	37,371	2,054,237
Hammers, pneumatic (chipping, riveting, calking, etc.)	16,003	2,842,611
Grinders, electric	10,894	812,553
Ohio	1,739	201,263
Other	794	265,024
Presses:		
Hydraulic—Bending and forming	8,359	3,697,092
Ohio	7,993	3,512,600
Forging	274	124,355
Power, for sheet-metal work	4,112	2,822,373
Illinois	315	115,992
Punching machines (not portable)	1,390	1,119,302
Ohio	236	307,299
Pennsylvania	571	197,495
Illinois	169	161,047
Riveting machines (not portable)	1,947	658,218
Screw machines (automatic):		
Multiple-spindle	954	2,833,781
Single-spindle	1,159	2,006,958
Shapers	1,569	2,052,805
Ohio	756	668,136
Connecticut	288	480,125
Slotters	81	446,363
Pennsylvania	66	342,293
Shears (power)	1,763	980,689
Wisconsin	657	237,378
Ohio	148	210,549
Illinois	246	138,937
Threading machines (except for pipe):		
Die type	162	277,515
Milling type	115	371,968
Rolling type	26	15,374
Tapping machines	554	424,053
All other machine tools	.....	22,110,484
New York	.....	5,503,099
Rhode Island	.....	4,974,575
Pennsylvania	.....	3,165,082
Massachusetts	.....	2,400,630
Ohio	.....	2,076,063
Illinois	.....	1,844,292
Michigan	.....	635,646
Wisconsin	.....	466,439
Connecticut	.....	380,235
Parts and attachments	.....	25,397,185
Ohio	.....	4,549,777
Connecticut	.....	4,387,016
Michigan	.....	3,565,734



Percentages Covered by Chief Products

	Number	Value
Illinois	.....	$2,666,376
Vermont	.....	2,349,759
Pennsylvania	.....	2,003,706
Massachusetts	.....	1,678,080
Wisconsin	.....	1,130,427
New York	.....	1,020,621
Rhode Island	.....	724,235
Indiana	.....	377,216
New Jersey	.....	314,520
All other products	.....	8,571,124

DISTRIBUTION *Among the Principal Types of Tools of Their Main Subdivisions and the States in Which the Largest Amounts Were Made. There were 14 general types with upward of $1,000,000 produced in each case, culminating in the lathe group, with $19,000,000. This compares with 12 types in the 1921 census, with a maximum of nearly $9,000,000 (presses), the lathes amounting to $8,644,000, or less than one-half the 1923 total*



NEW COMMISSIONS ADVOCATED

Chamber of Commerce of United States Presents Proposals to President Coolidge

WASHINGTON, Nov. 18.—Eight important and timely legislative proposals were presented to President Coolidge in person last week by President Richard F. Grant and Resident Vice-President Elliot H. Goodwin, of the Chamber of Commerce of the United States, as representing the position of American business on current national economic questions, and which were determined upon as the result of action by the organization membership. The subjects dealt with included repeal of income tax publicity; creation of a national tax commission; declaration of a policy regarding trade associations; the establishment and carrying out of a merchant marine policy; development of waterways; the Railroad Labor Board; the setting up of an immigration commission to recommend and administer legislation; and the extension of the budget system.

In view of the unfavorable reaction caused in all parts of the country by the steps which have been taken with respect to publicity under the revenue act of June, 1924, the chamber hopes for immediate repeal of the new provisions contained in the law of 1924.

In urging the setting up of a Tax Commission, which the Chamber of Commerce suggests might be a joint committee of Congress with members from both the House and the Senate and also representatives of the public, the aim sought is the study of the entire tax structure of the Federal Government and attention to inequalities which affect taxpayers, together with devising means for simplifying the law.

Relief for Taxpayers

"The work of such a commission should result in recommendations made in the light of American experience and the experience of other countries using forms of taxes comparable to those in this country," the chamber says in a statement. "Through success in the efforts of such a commission taxpayers would get relief from burdens that no law should cause and the government would obtain increased and more dependable revenues at a less cost of collection."

Pointing out that the chamber has a special interest in trade associations, because they form about one-third of the constituent membership of the chamber, it is desired to obtain from the Government a definite policy on this subject. In connection with the Sherman act, the chamber says that "prosecuting authorities of the Government have proceeded in such a way as to cause doubt in the public mind, not only as to the trade associations against which action has been instituted, but as to trade associations against which apparently no action whatever has been contemplated. The consequences are serious. Organizations and individuals against whom no accusation under existing law has been brought or is in contemplation are subjected to the injustice of being viewed with suspicion by the public. This is destructive of trade organizations. It takes constant effort to keep trade associations representative and vigorous. When suspicion is unjustifiably directed at an association, its members leave it. There is rapid disintegration."

Statistics of Trade Associations

The chamber advocates carrying into effect all recommendations which were made as a result of a referendum vote. The recommendations concern the use of statistics by trade associations covering capacity, production, stocks and sales, and statistics of actual prices in closed transactions which, it is held, should be collected by a trade association for its industry or branch of commerce. Such statistics, it is urged, should be distributed without any comment or interpretation which could induce or facilitate concerted action on the part of members. It also is maintained that the statistics should be made as available by a trade association to the public and Government agencies as to members of the association.

Regarding the Merchant Marine, the chamber says it stands committed to policies of subsidies, mail subvention, private ownership and operation as against Government competition with private operation. It adds: "To make possible the transfer of the Government fleet to private ownership the chamber is convinced that the war cost of this fleet must be marked off and that its real value is not to be arrived at by original cost and application of depreciation by what the ships will bring in the market.

"It finds present policies undetermined and vacillating, making extremely difficult any dependence on American bottoms for shipping abroad because of uncertainty regarding the future plan of operation, and it believes that more definite authority in regard to policies and their maintenance than that now furnished by the Shipping Board as at present constituted with seven members would materially advance the situation which the present confusion of executive and regulatory functions hinders."

Concerning inland waterways, the chamber believes that Congress should be asked to direct the United States Army engineers to make a comprehensive survey of the waterways of the country as a whole in their relation to other transportation agencies, and to recommend a definite plan and schedule of priorities for waterway development.

Protest is made against the Howell-Barkley bill to amend the transportation act. The bill is declared to be based on the opposition of railroad employees and their organizations.

The chamber went strongly on record in favor of the present form of the law governing the board which gives to the public the paramount voice.

Concerning the subject of immigration, the chamber advocates the creation of a United States Immigration Commission which shall study the operations of the law and make recommendations to Congress for future legislation and which shall also administer a flexible quota provision similar to the flexible provisions of the tariff law. Strongly upholding the budget system, the chamber urges extension of the present operation of the budget, which it says it believes requires no further legislative authority, but which will go far toward the completion of the objects of the budget system.

Steel Manufacturers Visit West Point

Judge Elbert H. Gary, chairman United States Steel Corporation, and Charles M. Schwab, chairman Bethlehem Steel Corporation, headed the advisory board of the New York Industrial District, which made its first official visit to the United States Military Academy at West Point on Nov. 13. The committee is charged with the responsibility for mobilizing industry in New York in the event of war, and details of the projected plans were discussed with Gen. F. W. Sladen, commandant of the post. The trip was arranged, Judge Gary said, "as a cooperative effort more thoroughly to familiarize us with army needs and facilities, and the army representatives with the facilities of industry to render prompt assistance in time of necessity." Brig. Gen. Guy E. Tripp, chairman Westinghouse Electric & Mfg. Co., also went with the party.

Simplifying the Manufacture of Stove and Furnace Pipe

WASHINGTON, Nov. 18.—The Division of Simplified Practice, Department of Commerce, has referred to the metal branch of the National Hardware Association of the United States and others interested a request it has received looking to the adoption of minimum weight of material used in the manufacture of stove pipe, furnace pipe, heater pipe and elbows. It is proposed that the division cooperate in simplifying these items in the same manner it gave its services to the eaves trough and conductor pipe industry. Among other things it has been suggested that all half sizes be eliminated.

Would Collect Monthly Figures on Industry

Director of Census Recommends Passing of Specific Legislation by Congress—Doubt as to What Will Be Done by That Body

WASHINGTON, Nov. 18.—Specific legislation authorizing the Director of the Census to collect and publish monthly figures concerning current industry and business statistics is requested in the annual report of Director W. M. Steuart of the bureau, which was made public this afternoon. The director points out that the monthly collection of these figures was considerably extended during the fiscal year ended June 30, 1924, and his recommendation shows the importance placed upon this class of data, and the necessity of making it more complete in the interest of the intelligent conduct of business. While it does not mention trade associations by name, the recommendation is of vital concern to them because of the important part they have in supplying figures. The director points out to Congress that this work was authorized by the act establishing the department and that it now has assumed such proportions as to render desirable the enactment of specific legislation. Such legislation, it is explained, would aid in the collection of the data, particularly from the comparatively small number of manufacturers and others who are unwilling or reluctant to supply the information requested by the bureau. In consequence, specific recommendation is made for the enactment of a law authorizing and directing the Director of the Census to "collect, compile, and publish statistics of current production, consumption, stocks, shipments, orders, receipts, and sales, for commodities used and produced in manufacturing."

Would Necessitate Monthly Compilation

The legislation would in effect compel industry to supply monthly figures, yet, as the director indicates, most of the data now are already available through the voluntary cooperation of the industrial interests of the country. Production of statistics for the biennial census is compulsory under the law, but it is the purpose of the director to make the figures more nearly complete and current by placing them on a monthly basis, and they would include figures from the few who now do not supply them. Growth in the use of these figures has been especially marked since the advent of Secretary Hoover as head of the Department of Commerce. They now are published each month in the department's Survey of Current Business. Complete business statistics can be obtained only through the collection of all figures and necessarily would reflect an entirely accurate condition of the activities of manufacturing and consuming sources, while under the present arrangement it is necessary to make estimates which, while they undoubtedly are closely representative of current industrial conditions, lack the details which would provide a complete statement of conditions.

Doubt as to Status of Associations

Reluctance on the part of some interests to provide figures is attributed to the doubt concerning the legality of certain activities of trade associations. This much-mooted issue never has been settled, and, while efforts to clarify the situation still are under way, present indications are that final solution of the problem, if it ever comes about at all, is a matter of the distant future. At the same time it has been suggested that the recommendation of the Director of the Census gives to operating trade associations, still assured of their legality, an opportunity to work out a plan which would be equal to giving authority to the Director of the Census to obtain the statistics he desires. The material manifestly would be used by the trade associations also.

The point has been made that forms for schedule calling for these statistics from all sources approached by the bureau might be worked out through cooperation between trade associations and the bureau. Considerable doubt exists that the recommendation made by the director will be granted by Congress. At the outset, it has been pointed out, it would require a considerable sum of money for the bureau and would represent a great deal of expense for industrial interests. But a plan of more complete voluntary cooperation in the estimation of some who are interested in the subject might develop the desired results without any difficulty or great expense.

Small Increase in Textile Machinery

Production of 428 establishments making textile machinery in 1923 is reported by the Census Bureau at $140,661,358, or an increase of 9.1 per cent over the $128,934,896 turned out by 421 establishments in 1921. The smallness of the gain may be attributed probably to the languishing condition of the textile industry. The wage earners increased 15 per cent, from 31,025 to 35,672, and their wages advanced from $38,830,660 to $46,022,545. The horsepower used in 1923 was 57,250 and the coal consumed 138,356 net tons.

Massachusetts led with 137 establishments and $67,779,712 of products, or 48.2 per cent of the total, in 1923. Pennsylvania was second with 70 establishments and $21,348,469 of products. Rhode Island reported 51 establishments and $18,994,165 of products. There were 56 establishments in New Jersey, 24 in New York, 17 in Connecticut, 14 in North Carolina, 13 in Georgia and the remaining 46 in 15 other States.

Increased Employment in Pennsylvania

Employment in manufacturing plants in the Philadelphia district is increasing gradually, the iron and steel group operating at a higher rate than in previous months. Employees of railroad shops have been kept busy with the tremendous volume of freight traffic and large orders for railroad equipment have given employment to hundreds. Steel mills at Homestead and Duquesne are operating at nearly normal rate and mills along the Monongahela Valley soon will be on full-time schedules. There also is less unemployment in mills of the Mahoning and Shenango Valleys. Foundries and factories at Reading are at higher rates and the surplus of common labor is gradually diminishing. Many departments of the steel industry in the Harrisburg district are working full time, others are still on part-time schedules. In the Altoona district, including Tyrone, Bellwood and Juanita, the railroad shops have resumed full-time operations.

Dr. J. C. Hartzell was the principal speaker at the monthly meeting of Cincinnati Chapter, American Society for Steel Treating, Nov. 13, his subject being "Fire Clay Refractories." Dr. O. C. von Schlicten, of the University of Cincinnati, described the geological research work being carried on by the university in the Cincinnati district.

At the monthly meeting of the Cincinnati Association of Purchasing Agents, Nov. 13, a motion picture depicting the manufacture of steel from the ore to the finished product was shown by the Bethlehem Steel Co.

Sheet Prices Advanced by One Company in Youngstown District

YOUNGSTOWN, Nov. 18.—The Newton Steel Co., principal independent maker of full finished sheets in this district, has advanced prices in line with the increase in other grades of steel sheets. The company has marked up No. 22-gage automobile body stock from 3.60c. to 3.75c. per lb., an advance of $3 per ton. The new price is more nearly in line with ideas of producers with respect to the highly finished sheet market, but it is felt in some quarters the quotation could be still further raised.

Makers of automobile body sheets expect to share proportionately in a large volume of business during the first quarter and first half of next year.

While this branch of the sheet industry has been stimulated by the quickening influences benefiting the industry as a whole, approach of the inventory season has served to hold much new business in reserve.

The Newton company is operating ten of the 20 mills at its Newton Falls plant in Trumbull County, Ohio, but expects to shortly enlarge this schedule.

Non-Ferrous Products Increased Heavily

Brass, bronze and copper products of 1035 establishments in 1923 are reported by the Census Bureau at $511,470,131, an increase of 138 per cent over the $214,903,735 from 911 establishments in 1921. In addition, $52,476,473 of similar products were made in 1923 in establishments engaged primarily in other work. The wage earners increased from 39,830 to 64,716 and their wages from $46,260,303 to $88,839,005. The horsepower used in the industry in 1923 was 307,344 and the coal consumed was 794,372 net tons.

Of the total production, $460,104,255 was "products for re-manufacture," $83,348,316 was finished products, $20,297,237 was products other than non-ferrous alloys and copper and $1,720,323 was custom and repair work. Products for re-manufacture included $113,670,335 of plates and sheets, $71,970,574 of rough castings, $59,682,732 of rods, $48,483,219 of plain wire, $37,517,615 of finished castings, $32,946,514 of seamless tubing, $26,491,758 of ingots and bars, $10,854,359 of insulated wire and $4,487,149 of brazed tubing.

New York had 172 of the establishments in 1923, followed by 112 in Pennsylvania, 106 in Illinois, 98 in Ohio, 82 in Massachusetts, 82 in Michigan, 69 in New Jersey, 68 in Connecticut, 51 in California and smaller numbers in 26 other States and the District of Columbia.

Demand for Pig Iron Not So Active at Youngstown

YOUNGSTOWN, Nov. 18.—While there has been slackening in the demand for pig iron the past week, following the buying activity immediately following the election, some of the Valley steel-making interests who entered the merchant market were enabled to build up comfortable backlogs.

The Youngstown Sheet & Tube Co., for instance, according to a statement by President J. A. Campbell, booked in excess of 100,000 tons of iron for shipment from its Chicago blast furnaces, since Oct. 26. If the demand at Chicago continues to show stability, the company plans another advance of 50c. per ton on basic and foundry grades.

In the Youngstown district, however, iron demand did not show the sustaining influences exhibited at Chicago, and prices have receded 50c. per ton, restoring basic to $19 and No. 2 foundry to $19.50.

An important interest at Youngstown has sold upward of 50,000 tons of iron since the election, the bulk of it to be shipped from furnaces in the South.

The Struthers Furnace Co., which has been experiencing financial difficulties, has 80,000 tons of iron piled in its furnace yard at Struthers. Most of this iron consists of foundry and other higher-priced grades, and the company hopes to temporarily solve its financial problems by the sale of this accumulated tonnage.

Moderate Increase in Plant Activities in the Valleys

YOUNGSTOWN, Nov. 18.—The Republic Iron & Steel Co. has blown in No. 5 blast furnace in its Haselton group at Youngstown. This week the Youngstown Sheet & Tube Co. started initial operations at its new eight-mill sheet plant, recently completed at its Brier Hill works, operating four of the units. These are the outstanding changes of the week in schedules of iron and steel properties in the Mahoning and Shenango Valleys.

There is moderate improvement in nearly all directions, affecting the industry in the Valleys. Production, held in abeyance preceding the election, is now being pushed for the most part.

By adding three more open-hearth furnaces, the Republic company increased the total number of independent open hearths in the district to 34 of 52. Steel Corporation subsidiaries are maintaining their steel plants at 80 per cent.

Of 127 sheet and jobbing mills in the Mahoning Valley 82 are rolling. The gain in the operation of the Sheet & Tube units was offset by loss of the four mills of the Waddell Steel Co., idle this week. Non-integrated sheet rollers are maintaining schedules of recent weeks with little exception.

There are 22 blast furnaces active of 45 in the Youngstown district.

The Republic company is operating two small bar, two skelp, 12 sheet and five tube mills, in addition to its plate mill.

The Carnegie Steel Co. is operating close to normal at Youngstown, while the Sharon Steel Hoop Co. is likewise above 90 per cent; Sheet & Tube company schedules in the Youngstown district are placed at 75 to 80 per cent; Trumbull Steel Co. at 80 per cent and the Republic company at 65 per cent.

Fabricating interests are holding their own, with production running from 70 to 90 per cent in most cases. The Truscon Steel Co. reports its new orders are in excess of production at its current 75 per cent rate.

Portland Cement Maintains High Pace

Production of Portland cement in October is reported by the United States Geological Survey at 14,820,000 bbl. This is the largest month on record, with the sole exception of August, with 15,128,000 bbl. Shipments for October were 17,081,000 bbl., a new high record displacing the previous record of 16,855,000 bbl. made in August. Stocks at the end of October were 6,143,000 bbl., there having been a progressive decrease in stocks since the end of March, when they amounted to 18,189,000 bbl.

For the first ten months of 1924 production has amounted to 125,283,000 bbl., compared with 114,777,000 for the first ten months of 1923—the previous high record. Shipments also have made a new high record with 129,873,000 bbl. in ten months, compared with 119,228,000 bbl. in the first ten months of 1923.

Manufacture of Coke in 1923

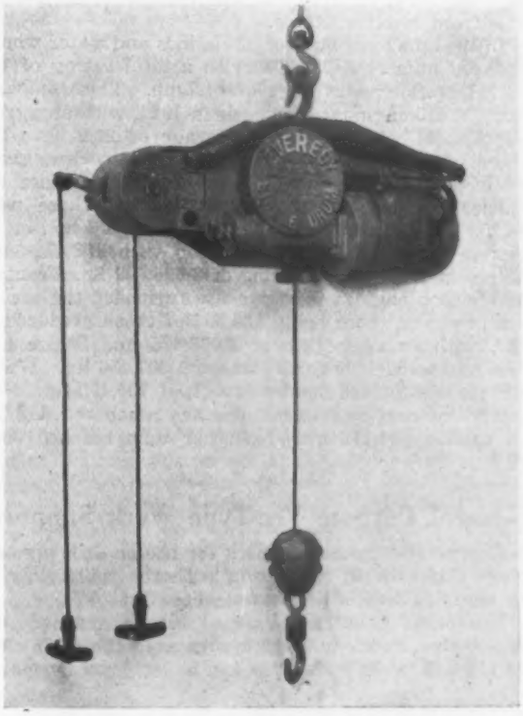
Coke and by-products were produced by 257 establishments in the United States in 1923 to the extent of $515,196,250, according to figures of the Census Bureau. This is 133 per cent more than the $221,331,363 produced by 176 establishments in 1921. The figures do not include gas-house coke. Of the total the products of by-product ovens amounted in 1923 to $401,793,200, while beehive ovens gave $113,399,050, both being heavy increases from the preceding year.

The average number of wage earners at the by-product ovens was 18,800 and their wages amounted to $32,013,087. Almost exactly half these figures were shown by beehive ovens, with 9371 wage earners and $15,837,698 annual wages. The horsepower used in 1923 amounted to 331,950, while the coal consumed aggregated 81,538,273 net tons.

Compact Single Drum Hoist

Compactness and light weight are features of a new single drum electric hoist known as the "Everedy," which is being marketed by the Reading Chain & Block Corporation, Reading, Pa. Three sizes are available, 500 lb., 1000 lb. and 2000 lb., respectively. The smallest weighs 215 lb. and is rated to lift its load at 41 ft. per min. on alternating current and 33 ft. per min. on direct current. The standard length of lift is 15 ft.

All parts of the hoist are arranged symmetrically about the horizontal and perpendicular centers to bring the center of gravity in line with the center of the hook. Deep grooves and a loop guard fitted close to the drum are intended to prevent the rope from leaving the grooves and piling up or overwinding. The worm and gear is incased in soft grease and require attention only at infrequent intervals. The gearing is self-braking and therefore the load will not lower until the motor is operated in the downward direction. An external brake for the motor acts in conjunction with the control mechanism and serves to stop the motor instantly when the power is shut off. The motor is ceiling mounted upon an extended support at one end of the hoist, and may be removed conveniently. An automatic adjustable limit stop is provided and works in conjunction with the hoist controller.



Single Drum Electric Hoist. Campact construction is a feature. The worm and gear are incased in grease

Developing Mineral Wealth of the Pacific Coast States

Plans calling for extensive development of minerals along the entire Pacific Coast have been adopted by the department of mines and mining of the Sacramento Chamber of Commerce, Sacramento, Cal. The general plans include the passage of a bill for the creation of a California State Department of Mines and Minerals by the State Legislature next spring; the organization of the Pacific Coast Chamber of Mines and Minerals; mineral surveys of all California counties, and a campaign to urge industries to utilize the large deposits of minerals in the West. F. W. Bunyan, steel metallurgist of the Southern Pacific Railroad Co., is chairman of the industrial and structural minerals department.

Winter Construction Urged by Building Material Industry

The campaign for more building and repair work during the winter months, aimed at reducing unemployment and giving the public greater returns for the money it spends on construction, is finding much of its most energetic support from manufacturers and distributors of building materials, according to the Division of Building and Housing of the Department of Commerce. Many of the most prominent concerns in the country, as well as organizations doing a smaller business and retailers, have called attention in various ways to the advantages of winter building.

The basic idea in the campaign is that all persons planning new construction or the employment of building trades workers for repairs or other purposes should take into account probable employment conditions in determining when to start the work. In this way the unemployment of building trades workers and of building material producing organizations during several months of the year would be reduced and the public would profit.

Demonstrates Grinders in Railroad Work

A demonstration of its new piston rod grinding machine and other machines especially adapted to railroad repair work was given at the plant of the Norton Co., Worcester, Oct. 24, before representatives of several railroads. Representatives of the Osgood-Bradley Car Co., Worcester, and the American Locomotive Co., Schenectady, were also present.

Of outstanding interest was the operation of the piston rod grinding machine, which has been designed to grind piston rods with the pistons mounted in place, as described elsewhere in this issue. This machine has a 40-in. swing in the gap, 16-in. swing over the table and is built in 96-in., 120-in. and 144-in. lengths. The grinding of piston rods, and later of axles, was demonstrated on the piston rod machine; chilled iron car wheels mounted on axles were ground in a car wheel machine; and miscellaneous smaller parts were handled on a 10 x 36 in. cylindrical machine and on a 6 x 10 x 36 in. surface grinder. The demonstration was directed by Hans Wickstrom, chief demonstrator of the Norton company.

More Screw Machine Products Made

Production of 179 establishments engaged in the manufacture of screw machine products in 1923 is reported by the Census Bureau at $39,110,582, an increase of 113 per cent over the 1921 figure of $18,365,242 from 160 establishments. These figures do not include screw machine products manufactured by establishments engaged primarily in other industries. This outside figure in 1921 was $3,533,575, or 19.2 per cent of the product within the industry. A similar percentage applied to the 1923 production would show about $7,500,000; this figure has not yet been ascertained.

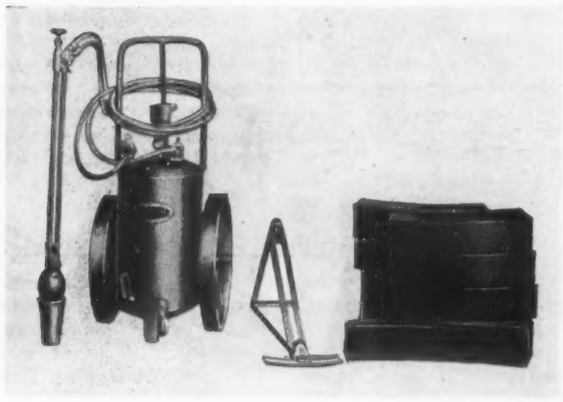
Wage earners to the number of 9084 were employed in 1923 compared with 5911 in 1921. Their wages advanced from $6,547,522 to $11,867,190. The horsepower used in the industry in 1923 was 29,028 and the coal consumed 37,641 net tons. Illinois had 32 establishments in 1923. There were 27 in Massachusetts, 27 in Ohio, 25 in Michigan, 15 in Pennsylvania, 12 in Connecticut, 10 in New York, 8 in New Jersey and the remaining 23 in 7 other States.

The Kansas City Bolt & Nut Co. is adding a new jobbing mill to its rolling equipment. This unit is an 84-in. two stand mill and the order for the mill together with the tables, shears and roller leveller has been placed with the United Engineering & Foundry Co., Pittsburgh. The mill will be electrically driven, the Allis-Chalmers Mfg. Co. furnishing the 1500-hp. 300-r.p.m. alternating-current motor required. A 30-ton standard crane to serve this mill has been placed with the Morgan Engineering Co., Alliance, Ohio.

Tire Heating Unit with Vacuum Torch

A tire heating unit designed to operate without pressure on the oil tanks or hose lines and which, it is claimed, cannot blow up or cause fires, is shown in the accompanying illustration.

The unit is a recent addition to the line of the Mahr Mfg. Co., Minneapolis. The tire heater is used in connection with the company's No. 101 Mahrvel safety vacuum tank, which has been approved by the National Board of Fire Underwriters' Laboratories. It is made up of a light stand, special nozzle and steel housing. The housing is assembled by sections around



Combination Torch and Tire Heater, Adapted to a Variety of Uses

the periphery of the tire to be removed and two flames, from the bottom of the tire and in opposite directions, are forced around its entire circumference within the housing. The major portion of the heat is confined to the rim, and it is claimed that the heating is unusually rapid.

This combination torch and tire heater is adapted for a variety of uses at terminal points. In thawing out locomotive ash pans, hoppers or other frozen parts it is said that the time required is but a few minutes as compared with hours when using steam. The torch may be used also to light locomotives, in which service it is claimed to save considerable time. Other uses include the heating of parts to be straightened and preheating of parts to be welded. For thawing out frogs, switches and other mechanism around terminals, the compressed air may be supplied from the air brake pump on a locomotive.

Wear of Gages

At a meeting held in Boston in September the gage steel committee of the Bureau of Standards, in association with numerous manufacturers, discussed in some detail a report which had the following two conclusions: First, that carbon-tool steel gives better wear resistance than oil-hardened chrome-bearing steel, from which some had expected better results. Second, soft gages do not necessarily have less wear resistance than hard but, from the indications of scratching, one concludes that the wear is greater because they are scratched. The scratches are spread into other scratches and so accelerate the wear. The results obtained by one concern showed clearly that, as long as the surface was smooth, the wear was not rapid and when it became scratched the wear was greater. That may be of importance.

Mechanical stokers sold by 13 establishments in October are reported by the Department of Commerce at 104 in number, of a total of 58,565 hp. This is the best total rating since February, being more than double the 25,988 hp. from 73 stokers in September. In October, one year ago, 15 establishments sold 88 stokers aggregating 32,576 hp. The average sales per month in 1923 were 122 stokers and 60,870 hp.

More Engines and Water Wheels Made

Production in 1923 of engines and water wheels is reported by the Census Bureau, from 249 establishments, to have amounted to $266,997,778, an increase of 33.8 per cent over the production of $199,498,575 from 296 establishments in 1921. The number of wage earners increased from 35,567 to 48,495 and their total wages from $52,004,861 to $70,877,950. The horsepower used in 1923 was 165,337 and the coal consumed aggregated 432,297 net tons.

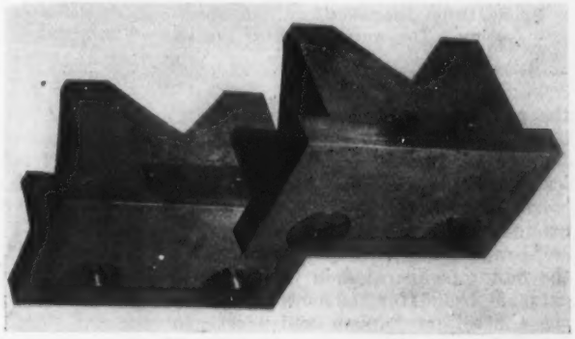
Michigan led in production with $99,418,313 or 37.2 per cent of the total. Wisconsin provided $32,286,810; Pennsylvania, $29,979,094; Illinois, $22,292,072; Indiana, $17,898,512; Ohio, $17,516,102; California, $13,832,149, and New York, $13,426,095. The remaining $20,348,631 came from 17 other states.

In 1923 the total number of engines and water wheels produced numbered 739,308, with a total rating of 16,024,921 hp., or an average of 21.7 hp. This compares with 372,415 engines and wheels in 1921, with an aggregate of 8,143,886 hp., or an average of 21.9 hp. The largest single item was automobile and truck engines, not including those made in the factories where the vehicles themselves were made. In 1923 there were 365,259 such engines, aggregating 9,126,006 hp., or an average of 25 hp. This compares with 158,412 such engines in 1921, with a rating of 3,696,669 hp. Tractors and traction engines for farm use furnished the second item in power, there being 126,854 of these produced in 1923, with an aggregate of 2,663,475 hp. Steam turbines numbered 1709 for a total of 1,507,456 hp. Water turbines and motors numbered 527, of 709,495 hp. Stationary internal-combustion engines numbered 118,282 and totaled 694,172 hp. No other item reached 300,000 hp.

General Purpose Vee-Type Work Support

A general purpose vee-block for use on drill presses, lay-off tables or in connection with the table slots of any machine tool is illustrated herewith.

The block is fitted with tool steel, hardened and ground pins, as shown, which engage in the table slots and aline the vees. The pins can be let down by means



General Purpose Vee Block. The locating pins can be pushed into the block and locked quickly

of an ordinary screw driver and can be locked quickly in either direction. The sides of the block are accurate within 0.001 in.

Three types of the device, which is being marketed by the Crescent Engineering Co., 404 West Conway Street, Baltimore, are available. These types are designated as the V-99, V-100 and V-101 and are intended for round stock from ⅜ to 3 in. in diameter, blocks for larger sizes of stock being available on order. On some types the keys are off center, which permits the edges to be squared with a table or plate that is machined. Suitable clamping facilities are provided on each block as shown.

French pig iron production in September was 641,000 metric tons, compared with 656,000 tons in August. Steel production was 598,000 tons, compared with 582,000 tons.

EDUCATING NEAR-EAST BOYS

Creating "Artificers in Brass and in Iron"—Developing an Ancient Land with Modern Tools

BY FRANK W. OBER

TO the minds of iron men, the Near East Relief signifies only "feeding starved children." That was why Near East Relief was called into existence. Having 40,000 children in its care, it could not let go. Some were babies, thousands were growing boys of 10 to 15 years. All these are being taught to work at some one of 40 trades at which they may most likely find employment. Iron and steel work, automobile repairing, tool making, grill and agricultural tool work, adapted to the country's demands, are taught. They are in a land of oil developments, manganese and copper deposits in vast quantities, and of coal fields yet to be developed. Railroads must be run here and machine shops provided. These will demand an army of mechanics to be developed on the ground for these trades, of whom there are few in the Near East.

The war introduced automobiles and built roads. Now there is a 3-day automobile service between Beirut, Damascus and Bagdad, whereas a few years ago camel trains took 30 days to carry freight and passengers. An observer who has known the Near East for over 30 years reports that at the Bushire port for Persia crated automobiles are stacked high. American agents are pioneering trade for the next decade at all the Mediterranean ports. This means employment for iron and steel workers of the many related trades.

A "Children's City" of 26,000 came into being "over night," taking possession of the abandoned Russian military post at Alexandropol in the Caucasus, under the shadow of Mt. Ararat, where Noah found himself and, opening the doors of his ark, began his job of repeopling the earth with eight folks to start with and no machinery, tools, railroads or markets. The city was 300 miles from Batum on the Black Sea, the port of the oil fields, the railhead, and the nearest port to which supplies sent from America reach Alexandropol on the main line of the railroad through Baku to Bagdad.

Among these vast vacated shells of army barracks were repair shops for automobiles, forges, tin shops and all the machinery for keeping up a vast army base—a wreck of it. The Near East Relief had to maintain transportation and provide all the equipment for a living enterprise. It did its job well in its fight with death, food and scant funds being supplied by philanthropic America. Before the first shipload of food supplies arrived at Batum 200 children died each week and were buried in long trenches. After that ship was unloaded, only those who were too far gone for saving died, and now the death rate is less than in New York or Chicago. That was a fight with death well handled. The job is being continued by giving every developing youth a trade and skill to equip him to win his own bread in the countries which are to be developed from the ground up. The job is broadening into saving a land and a people.

As land was available for producing grain and food on a large scale, 21 tractors were sent out from America. Older boys soon learned to run them. When they broke down, as tractors and automobiles do, extra parts were to be found only 5000 miles away. In the machine shop the boys learned to cut threads and make anything and everything out of iron and steel. The army junk heap became invaluable. Parts of wrecked automobiles furnished materials for repairs and for tools. Every one of the automobiles used daily in serving this vast orphanage carries a boy mechanician as well as a driver.

Out of these thousands of older boys who go out into life to make their way at 16 will come forces of mechanically trained men to meet the demands of a new day. The railroads took many of them after the war. They had learned to temper steel, as well as to shape it. When a spring broke on an automobile the scrap heap supplied material. The temper was drawn, it was shaped on the anvil, retempered and placed. Necessity proved a clever schoolmaster.

A boy of 14 built a one cylindered automobile. Crude though it was, it ran. He made the engine himself. The mudguards and body were shaped from old Standard Oil cans. In making it the boy became an intelligent mechanic.

Since the tractors were introduced in the Near East the Government has bought 150. It will need men to run them and to repair them. An automobile of a certain make was brought over which negotiated the heavy grades so well that the Governors of the three trans-Caucasian States now run an automobile of that make. That is the way with tools and pumps and machinery introduced from America. They have seen it worked there and duplicated. One order for a certain pump, proved up in the oil fields, amounted to $1,000,000 and was placed in America.

All these orphan children work. In one family of 6000 but one chief cook is employed. This means forming habits of industry and also training in 40 trades. Iron men are interested in opening new territory in which a producing and skilled generation of workers in iron or steel is being raised up, whereas before mainly pastoral and trading people existed.

The first American windmill ever seen in Persia was introduced by an American machinery company in Bahrein, Persia. Now these "water raising machines," as the natives call them, are at work by the scores over the entire Near East. Dr. Samuel M. Zwemer, familiar with Egypt for a generation, says that the American firm which can produce a pump which will raise water 8 to 10 ft., run on oil and be foolproof will reap a fortune in that country, for all this work is now done laboriously by men with buckets.

On "Golden Rule Sunday," Dec. 7, America will think of starving children and give something of their plenty to keep these alive until they can go out "upon their own." Like all goodwill help this will be as "bread cast upon the waters, which will return unto them after many days." Better than that, however, it is an expression of goodwill to fatherless children on this day halfway between Thanksgiving and Christmas in the land of Tubal Cain, the Damascus blade and of Vulcan, the titular god of the furnace.

National Employment Service Favored by Russell Sage Foundation

NEW YORK, Nov. 20—A great deal of quackery and pseudo-science is being exercised in the technique of selecting applicants for employment, and the greater part of the experimentation—scientific and otherwise—that has been carried on in regard to the selection of workers is still comparable to the "home remedies" stage of medicine and surgery, according to an exhaustive report on "Public Employment Offices—Their Purpose, Structure and Methods," which has just been issued by the Russell Sage Foundation.

The value of the judgment regarding an applicant for work which is based on the look in his eye, the condition of his hands, or the condition of his collar, is minimized in the report, as is also the practice of arbitrarily classifying applicants for employment according to any standard list of types of personalities.

After reviewing the various methods by which workers get jobs and employers get workers, the report draws the conclusion that these methods are inadequate to the needs both of industry and of the workers; it recommends the establishment of a nation-wide free employment service to be operated jointly by the Federal, State and local governments.

The members of the Electric Hoist Manufacturers Association report a decrease of 12.9 per cent in the number of hoists sold in October as compared with September and a decrease of 20.2 in the value of hoists ordered. Shipments decreased 12.5 per cent as compared with shipments made in September.

Five Companies Make Casting from the Same Pattern

BOSTON, Nov. 17.—The November meeting of the New England Foundrymen's Association, held Wednesday evening, Nov. 12 at the Exchange Club, Boston, was one of the largest attended and most interesting events of its kind held in months. More than 132 attended, including a large number of foundry superintendents, as well as foundry owners.

The Broadway Iron Foundry and Barbour, Stockwell Co., Cambridge, Mass.; the Athol Machine & Foundry Co., Athol, Mass.; the Delano Iron Foundry, Chelsea, Mass., and the Worthington Pump & Machinery Co., East Cambridge, Mass., each submitted for inspection a poppet valve, for locomotive use, cast from the same pattern. Patrick Jordan, foundry superintendent, Athol Machine & Foundry Co., who had charge of the exhibit, declared two of the castings were perfect and the remaining three imperfect.

A general discussion followed as to the merits and demerits of each casting, and ways and means of perfecting the said castings and patterns were freely discussed by superintendents and others, with general practical foundry molding problems injected during the discussions. R. F. Harrington, Hunt-Spiller Mfg. Corporation, South Boston, touched on the recent Milwaukee convention and the report of the molding and research committee made at the convention.

New Iron, Steel and Metal Working Plants on the Pacific Coast

Nine out of the 16 new industrial plants that have been established or enlarged at Oakland, Cal., during the past year are connected directly or indirectly with the iron and steel trade of the Pacific Coast, according to the annual report of O. H. Fischer, president of the Oakland Chamber of Commerce.

Activities of these nine concerns during the past year in Oakland were as follows:

The purchase by the Malleable Iron Works, Rockford, Ill., of 15 acres, the erection of a large plant, and its entering production on Sept. 2. It is the only malleable casting plant of large size west of the Mississippi River.

The completion of the new plant of the Westinghouse High Voltage & Insulator Co. on the 12-acre site of the parent company, the Westinghouse Electric & Mfg. Co.

The building of a large plant which will begin operations Dec. 1 by Hibbard & Co., Pittsburgh, for the manufacture of railroad tool equipment, electrical equipment and hardware.

The erection of a large plant which began operations in October by the Illinois Wire & Cable Co., Sycamore, Ill.

The completion of a large warehouse and industrial plant by the Westinghouse Electric & Mfg. Co.

The doubling of the size of its original plant built in 1923 by the Detroit Steel Products Co. as the result of the Pacific Coast business of the new plant exceeding the chartered quota.

The purchase by the Aluminum Cooking Utensil Co. of a large site for the erection of a large plant in the near future.

The breaking ground by the General Electric Co. for the erection on its 23-acre site at East Oakland of the first copper wire drawing plant on the Pacific Coast.

The purchase of a site in West Oakland for the erection of a plant by the Montague Pipe & Steel Co.

Domestic sales of oak leather belting, as reported by the Leather Belting Exchange for October, amounted to 338,425 lb., valued at $576,338, or an average of $1.70 per lb. This is a slight reduction from the sales in September, which amounted to 348,251 lb., valued at $581,231, or an average of $1.67 per lb. and a considerable reduction from the figures for October, 1923, when the sales amounted to 447,264 lb., valued at $827,438, or an average of $1.85 per lb.

Plans of the Youngstown Sheet & Tube Co. Are Being Pushed

YOUNGSTOWN, Nov. 18.—Plans of the Youngstown Sheet & Tube Co. for additional rolling mill capacity at Indiana Harbor, so as to improve its competitive position in the Chicago district, have received a substantial impetus as a result of the business improvement of the past two weeks. The directors were scheduled to meet Wednesday of this week for final action on certain of the recommendations outlined.

It is considered likely the company will proceed to expedite construction of additional sheet and tin plate mills in the Chicago area, beginning work earlier in 1925 than originally planned and pushing the projects to completion with as little delay as possible.

The company's expansion program for 1925 will be concentrated to a large extent on its Chicago district properties. Disposal of the Western Reserve sheet mills at Warren to the Trumbull Steel Co. is another probable development of the near future. This is the only remaining detached sheet property of three acquired by the Sheet & Tube company in the absorption of the Brier Hill Steel Co., which the parent company still retains.

Automobile Accessories Merger

The Stewart-Warner Speedometer Corporation and the Bassick-Alemite Corporation, Chicago, two of the largest manufacturers of automobile accessories, have been merged. The Stewart-Warner corporation has acquired the majority of the stock of the Bassick-Alemite Corporation through an exchange of stock on the basis of approximately seven shares of Stewart-Warner for ten shares of Bassick-Alemite. The Stewart-Warner Corporation has total assets of about $28,400,000 and authorized capitalization of 600,000 shares of no-par stock, of which about 475,000 shares are outstanding. The Bassick-Alemite Corporation has total assets of approximately $5,600,000 and 200,000 shares of no-par common stock and $1,175,000 of preferred.

Trumbull Steel Co. Improvements

President Jonathan Warner of the Trumbull Steel Co., Warren, Ohio, announces the company is expending $500,000 for repairs and alterations, affecting its sheet galvanizing and electric power equipment chiefly. The business outlook presents such hopeful aspects that the company has important developments under consideration. Chief among these is the construction of five additional open-hearth furnaces, which would give the company a total of 12, with an annual steel ingot capacity of upwards of 700,000 tons.

For several years the Trumbull company has had under consideration plans to enlarge its steel-making facilities, inasmuch as it is not fully self-contained in the matter of steel supply. Officials believe the company can manufacture steel more cheaply than buying it on the open market at prices which have generally applied this year for semi-finished products.

The elimination of Pittsburgh price basing has perhaps had less influence on the Trumbull company than any others in the Youngstown district, because the bulk of its tonnage, aside from tin plate, is shipped into Detroit, northern Michigan and northern Ohio. Officials say they can ship sheets and strip steel into Detroit cheaper than competitors in the Chicago territory.

They look for substantial tin plate business in 1925, judging from the inquiries before the trade.

Earnings of the Trumbull company in the third quarter were sufficient for its preferred and common stock dividend requirements, after all charges. The volume of business is steadily expanding.

Beals, McCarthy & Rogers, iron and steel jobbers, Buffalo, are planning the erection of a warehouse at a cost of about $500,000. Robert J. Redpath, Buffalo, is the architect for the new structure which will be two stories, of concrete and steel construction, and will cover two acres.

Lower Baltimore-Pittsburgh Rate on Fluorspar Asked for and Opposed

Considerable opposition was voiced by domestic producers of fluorspar to a request for an adjustment in the freight rate on imported fluorspar from Baltimore to Pittsburgh made by Pittsburgh district steel companies at a hearing held at the Chamber of Commerce of Pittsburgh, Nov. 12. The tariff from Baltimore to Buffalo on this material is $3.28 per ton and from Baltimore to Pittsburgh is $4.80, although Pittsburgh is nearer Baltimore by more than 200 miles than Buffalo. The demand of the steel companies was for a rate of $3.08 to Pittsburgh from Baltimore to put Pittsburgh on a relative distance basis with Buffalo and to harmonize with the present rate from Philadelphia to the two points, which is $3.28 to Buffalo and $3.02 to Pittsburgh.

It was argued by steel company traffic officials that if the Baltimore & Ohio Railroad hauled the material from Philadelphia to Pittsburgh, it would have to do so at the published tariff of $3.02 and since the material would have to be hauled through Baltimore, there was no justification for the Baltimore-Pittsburgh rate of $4.80.

R. C. Allen of the Rosiclaire Lead & Fluorspar Mining Co., Chicago, opposed the revision on the ground that Illinois and Kentucky producers already were operating without profit or at a loss as a result of the narrowing of their market and low prices brought about by competition from the imported material. To reduce the freight rate to Pittsburgh, he contended would mean increased competition from imported material and might well force out of business the Illinois and Kentucky producers whose costs were very much higher than those of foreign companies. He said that the average yearly consumption of fluorspar in the United States was about 150,000 tons and taking out the 42,000 tons imported in the past year and about 9000 produced in the West, there was left only about 100,000 tons for the Illinois and Kentucky companies, which as a result of the wartime expansion now had a capacity for producing 200,000 tons annually. Many of the producers in that district had to shut down and he estimated that for some time there had been only about a 50 per cent operation of the mines. G. H. Jones, president Hillside Fluorspar Mines Co., Chicago, gave testimony supporting that of Mr. Allen.

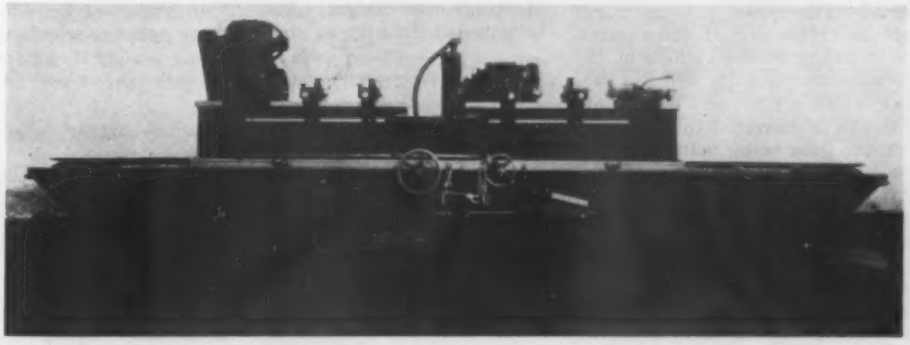
Steel company representatives stated that the intent of the request for the rate revision was to straighten out an inequality and not to kill a domestic industry, upon which the Pittsburgh manufacturers were largely dependent for fluorspar supplies.

It was brought out that the rate on domestic fluorspar from southern Illinois mines to both Pittsburgh and Buffalo was $5.25 a ton despite the much longer haul to the latter point.

W. R. Askew, New York, of the auxiliary committee of the Trunk Line Association and W. J. Kelly, Chicago, of the auxiliary committee of the Central Freight Association, heard the case.

Locomotive Piston Rod Grinding Machine

A new machine for grinding locomotive piston rods, placed on the market recently by the Norton Co., Worcester, is shown in the accompanying illustration. It is of the gap type and is designed to grind the largest piston rods in common use without removing the piston from the rod. This grinder may be employed also for grinding axles, valve rods and other long cylindrical work and may be used to grind crank pins, bushings and other short straight work, if a smaller machine is not available.



Locomotive Piston Rod Grinder of Gap Type. The rods are ground without removing the pistons. The machine may be used to advantage also for grinding axles, valve rods and other long cylindrical pieces

The machine is available in three lengths, 96, 120 and 144 in. between centers, with a swing over the table of 16 in. and a gap swing of 40 in. The standard length of the gap is 19 in. and it is located in the center of the table, but it may be had in widths of 13, 25, 31, 37 and 43 in., located at any point along the table.

A 2-hp. motor on the headstock revolves the work, which turns on dead centers, a variable speed motor being employed in order to provide the necessary variations in work speed. A large diameter screw operating in a half-nut lapped to fit is said to produce an accurate wheel feed. The feed is operated by an index gear wheel at the front of the machine, which advances the grinding wheel in increments of 0.00025 in. The index crank permits of rapid traverse of the wheelhead in changing from one diameter to another. Grinding lubricant is pumped from a tank in the base of the machine.

Third National Power Show

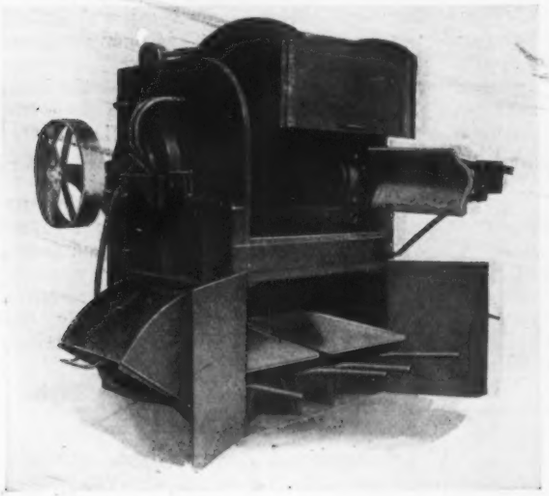
During the week of Dec. 1 to 6, in connection with the annual meeting in New York of the American Society of Mechanical Engineers, the third national exposition of power and mechanical engineering will be held in the Grand Central Palace, Lexington Avenue, New York. This show will open at 2 p.m., Monday, Dec. 1, and at noon on each succeeding day of the week, and will close at 10.30 p.m. each day. Exhibits as usual will include steam generating units, prime movers, super-heaters, economizers, stokers, refractories, condensers, cooling towers, pumps, copper and brass materials, valves, motor controls, governors, regulators, measuring devices, bearings, gears, belting and numerous other types of analogous equipment.

Receivers' sale of the Atlas Steel Corporation is announced for Nov. 26 at Mayville, N. Y. A group of bankers and business interests of Dunkirk, N. Y., is prepared to submit a bid for the company's property in that city, its principal holding. Other plants are located at Charleroi, Pa., and Welland, Ont., while the company controls a valuable industrial site at Niles, Ohio. The Atlas Steel Corporation was a consolidation of the Electric Alloy Steel Co., Youngstown, and the Atlas Crucible Steel Co., Dunkirk.

A Corrugated Sand Blast Barrel

A sand blast tumbling machine with a corrugated barrel has been developed by the Rockford Malleable Iron Works, Rockford, Ill., which has made arrangements with the Arcade Mfg. Co., Freeport, Ill., for its construction and marketing.

The shell of the barrel has a corrugated cylindrical surface designed to produce a uniform rolling motion of the work while blasting, thereby subjecting every crevice in the work to the action of the blast and greatly reducing breakage. The parts of the barrel which



Sand Blast Tumbling Machine with Corrugated Barrel. Thorough blasting and reduced breakage of work are claimed

are subjected to the abrasive action of the blast, namely, the barrel head, the staves, the door frame and door, are cast from a special mixture of manganese-treated white iron to assure high resistance to the action of the sand blasting material. The barrel is of sectional construction to facilitate the replacing of worn parts. The staves are bolted to a flange on the outside of the barrel head to eliminate wear on the bolts and the barrel is carried by journals which are securly bolted into the head. The driving power is delivered to the barrel through gear and pinion, the gear being bolted directly on to one of the journals and the pinion being keyed to the pulley-driven shaft.

The journals are hollow and have carefully machined surfaces which ride on specially constructed rollers 5 in. in length, the rollers operating in an oil bath. Each journal carries a floating plate through which the abrasive is projected by a sand nozzle. The roller bearings, which are compensating, as well as the drive gear, are included in a dust proof journal box. The barrel door is secured by four clamps and is handled by a hand crane mounted on the machine. The mixing casting is of special design to resist the abrasive action of the sand. The sand nozzles are cast in a specially treated mixture of white iron and are designed to give an average of three days' service without replacing. The sand nozzles are replaced by loosening two set screws which are inserted through the mixing casting nozzle clamp and then by sliding the worn nozzle out after which the set screws are tightened. The nozzles may be replaced while the barrel is in motion.

The abrasive falls through openings in the barrel into sand hoppers which are hinged at the bottom of the frame of the machine, and a removable screen in each hopper provides the means of eliminating foreign materials from the abrasive. When unloading the barrel the hoppers are swung out of the frame.

The frame consists of two gray iron side castings held together by 3-in. channels securely bolted. The casing is of heavy sheet steel with a double unloading door and a counterbalanced loading door. An exhaust collar is mounted on top.

In operation the abrasive material makes a complete cycle. It is elevated by suction from each sand hopper through a piece of 1½-in. hose to the mixing casting in the hollow journals. At this point the abrasive is picked up by the air nozzles and injected into the barrel against the work at high velocity. It subsequently sifts through the openings in the barrel and into the sand hoppers below.

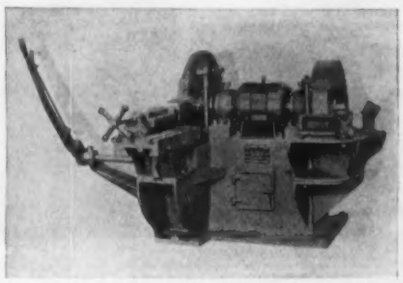
Hot-Sawing and Burring Unit for Use with Upsetting Forging Machines

An electrically driven hot sawing and burring machine, for use in conjunction with upsetting forging machines for the manufacture of jaw and T forgings where the end of the bar is required to be split in order to facilitate the upsetting operation is illustrated herewith.

The machine, which is being marketed by the Ajax Mfg. Co., Cleveland, may be employed also for cutting up bar stock to the proper length for the forged piece and for sawing a forging off the end of a bar at the same heat at which it is forged. The burring wheel is used for hot milling of flashes or burrs from forgings, particularly those produced in somewhat worn dies at the same heat as forged. It can also be used to advantage for milling the fins from butt-welds.

Heavy construction is a feature of the machine. The base is a one-piece casting to which the spindle bearings are securely lipped in and bolted. At the saw end of the machine a table carried on long plane ways and manually operated through a rack and pinion is provided. This is arranged for mounting two gripping devices, one for cross sawing or cutting off, and the other for longitudinal splitting.

The machine is available in three sizes. The No. 1 machine is equipped with a 14-in. diameter saw and burring head; the No. 2 unit has a 20-in. saw and 24-in. burring head and the No. 3 machine a 30-in. diameter saw and 24-in. burring head. These require motor ratings of 7½, 10 and 15 hp. respectively. Individual motor-drive is provided, the motor being of Westinghouse design. The motor armature or rotor is mounted directly on the machine spindle, which rotates on ball bearings. The stator is mounted on the machine base casting and is provided with guards on each end to protect the motor windings against flying scale and dust.



Sawing and Burring Machine for use in Conjunction with Upsetting Forging Machines. Three sizes are available

Group life, health and accident insurance has been acquired by more than 90 per cent of the employees of the Birmingham Iron Foundry, Derby, Conn. The company and workers jointly pay the premium on $323,000 of life insurance to the Metropolitan Life Insurance Co. The contract provides $1,000 life coverage for each employee and also health and accident benefits of $10 a week for a maximum period of 26 weeks. The Chemung Foundry Co., Elmira, N. Y., has made a similar arrangement for $53,000 of group insurance, and the Seward Wire Co., Inc., Parkersburg, W. Va., has provided group insurance for its 80 employees.

Manufacturers and Farmers Confer

Plans for Better Understanding Discussed by President Barr of National Founders' Association and Leaders of the National Grange in Meetings at Atlantic City and New York

A MOVEMENT to bring about a better understanding between industry and agriculture had its inauguration at Atlantic City, Nov. 15. A conference and luncheon were given at Haddon Hall at which 91 manufacturers and farmers were present. The manufacturers came from various parts of the country to meet the delegates and officers of the National Grange during the fifty-eighth annual convention of the grange.

The conference was opened by L. J. Taber, master of the National Grange, and William H. Barr, president of the National Founders' Association, acting as dual toastmasters. The conference was especially representative of agriculture, as every officer and practically every National Grange delegate were present.

In beginning his address of welcome to the manufacturers, Mr. Taber announced that the masters of 28 State granges, extending from Maine to California, were seated in the hall.

Addresses were made by National Master L. J. Taber, William H. Barr, Henry D. Sharpe, of Brown & Sharpe, Providence, William J. Thompson, of Maine, chairman of the executive committee, National Grange, and John McSparran, master of the Pennsylvania State Grange. The speeches bore largely on the necessity of cooperation between industry and agriculture in matters affecting the welfare of the Nation, and the utmost harmony prevailed.

First Step Taken

The conference marked the first step in a movement started by Henry Harrison Lewis, of Washington, acting in cooperation with the National Founders' Association, the National Metal Trades Association and prominent manufacturers identified with various other organizations. The movement is called "Better Understanding Between Industry and Agriculture," and is to be devoted to the encouragement of legitimate cooperation between the business men of the city—the manufacturers—and the business men of the country—the farmers.

The necessity of such cooperation, evidenced by the fact that both industry and agriculture are subject to recurrent demagogic attack, led to the establishing of contacts with a number of farm leaders, and finally to the formation of a definite movement. A committee on organization was created, having as its members representing industry, W. W. Coleman, president Bucyrus Co., South Milwaukee, and recently president National Metal Trades Association; Henry D. Sharpe, president Brown & Sharpe, Providence; William H. Barr, president National Founders' Association; Justus H. Schwacke, president William Sellers & Co., Philadelphia, and J. D. Cox, Jr., president Cleveland Twist Drill Co. The members representing agriculture were: William J. Thompson, of Maine, chairman of the executive committee of the National Grange; Sherman J. Lowell, former master of the National Grange; Prof. T. C. Atkeson, Washington representative of the National Grange; O. L. Martin, master of the Vermont State Grange, and C. A. Dyer, overseer of the Ohio State Farm Bureau Federation. William J. Thompson is chairman of the committee on organization, William H. Barr is treasurer and Henry Harrison Lewis, executive director.

An advisory committee to consist of one industrial leader and one agricultural leader from each of 20 or more States is being rapidly completed. Among the manufacturers on the advisory committee, in addition to those serving on the temporary committee on organization are: H. A. Atkins, president E. C. Atkins Co., Indianapolis; Harold C. Smith, president Illinois Tool Co., Chicago; Charles L. Taylor, Taylor & Fenn Co., Hartford, Conn.; Jerome R. George, of Morgan Construction Co., Worcester, Mass., and Charles S. Lewis, president Charles S. Lewis & Co., St. Louis.

It is expected that, as the movement progresses, State advisory committees will be found necessary to give direct attention to strictly State problems. Membership on the State committee will be offered to the leading men in industry and agriculture in each particular State.

Object of the Movement

Those in charge of the movement state that it is simply to bring about a better understanding. This will be done through conferences between industrial and agricultural leaders.

Advantage will be taken of the numerous industrial conventions and agricultural meetings held during each year in various parts of the country. Manufacturers attending conventions will meet in conference leading farmers, especially invited for the purpose, and agricultural leaders attending farm meetings will confer with manufacturers invited for the purpose. The recent satisfactory conference and luncheon at Atlantic City was the first. The second conference is being held in connection with the twenty-eighth annual convention of the National Founders' Association, at the Hotel Astor, this week.

Other conferences are being arranged. A number of State granges which are usually attended by several thousand farmers have offered to devote a part of their annual convention time to the conferences, and many national and local industrial associations have shown equal interest. It is announced that an important feature of the movement will be a clearing house, located in Washington, for the dissemination of industrial and agricultural information, under the direction of Henry Harrison Lewis, who brings to the work an experience of more than a decade in both industry and agriculture.

President Barr's Address

Mr. Barr in his address at the Atlantic City conference called attention to the vital need of cooperation between the two producing classes, and said in part:

"I am sure that this conference marks the beginning of a movement which is so eminently sound, so much needed, and so designed for mutual benefit and well-being, that it cannot fail to succeed, and in large measure. We are all here because we realize that there is a great similarity of joint interest between the real farmers who produce commodities for sale and distribution as a result of their industry with the land and its attributes, and the manufacturers who produce commodities for sale and distribution by their industry with labor and machinery and raw materials. Cooperation by people of different occupations such as the farmer and the manufacturer, whose daily thinking and planning, and whose physical processes are in terms not greatly alike, one with another, must presuppose some effort to understand each other's problems and ideals, and that is why we purpose holding conferences at every available opportunity, and also to establish in Washington under Mr. Lewis' direction a clearing house through which industry can apply to agriculture for legitimate aid, and agriculture can seek the benefit of direct cooperation with industry. The result is bound to be that, instead of antagonistic efforts for fancied advantage and class interest which in the long run proves to be neither, we will come to think—and this is the first tangible evidence of it—I believe, in

terms of where there is real advantage in dissimilar organizations working together."

Mr. Sharpe Speaks

Henry D. Sharpe, of Providence, met with approval in calling attention to the fact that agriculture had become a business proposition as never before. He added:

"Industry realizes this, and good business men instinctively look to understand other's problems, which, after all, may be similar to their own. The farmer's business life is made up of somewhat the same factors as that of the manufacturer. He must have capital to acquire it, or else some other method of leasing or operating. He must have current necessary supplies of materials, and demands labor which fluctuates more than our own demand for labor. He must have the kind of product that he can best produce on his land and the best market. He has the same questions of transportation and the adequacy of the routing service. And I think he goes all the way with us in the problem of keeping an interest in his product as it moves through the channels of transportation to the final consumer.

"With agriculture and industry working together to effect a better understanding of each other's problems, to join in the support of our traditional form of government, seeking to protect each other in the pursuit of his calling, and our people in their practice of a well-ordered liberty, a great deal is possible. Without doubt we have much of common interest."

Among the manufacturers present at the Atlantic City conference, in addition to those who addressed the meeting, were Norman J. Gould, president Gould Mfg. Co.; Frank J. Lanahan, president Fort Pitt Malleable Iron Co.; William S. Hallowell, Cochrane Corporation; Staunton B. Peck, Link Belt Co.; Thomas W. Pangborn, Pangborn Corporation; Frank J. Eppele, Trenton Malleable Iron Works; Justus H. Schwacke, president William Sellers & Co.; C. E. White, Deere & Co., Moline, Ill.; A. P. Smith, A. P. Smith Mfg. Co., East Orange, N. J.; F. M. Weymouth, Hunt-Spiller Mfg. Co., Boston; and Robert Biddle, president Biddle-Gaumer Co., Philadelphia.

President Barr's Address at Meeting of National Founders' Association

AT the opening session of the annual meeting of the National Founders' Association, Nov. 19, at the Hotel Astor, New York, President William H. Barr told of the new movement, known as the "Better Understanding Between Industry and Agriculture." During the past few months he and his associates have been actively engaged, with the assistance of Henry Harrison Lewis, Washington, in perfecting a plan to bring about direct and practical cooperation between all industry and agriculture. Negotiations conducted with farm leaders representing the largest and most influential agricultural organization in the country, the National Grange, have resulted in the inauguration of a movement of vital importance to the entire nation.

The new movement, as a part of its activities, will provide farm leaders as speakers at industrial conventions and industrial leaders as speakers at farm meetings, local, State and national. There also will be widespread publicity through usual channels, and in time a development of the national movement into intra-State cooperation in such vital problems as taxation, attacks on the constitution, and the rights of property.

Mr. Barr discussed such topics as: Education of Our Voting Population; Preserve Supreme Court Powers Intact; Government Ownership Fallacy; and The Communistic Twentieth Amendment. He dwelt at some length also on the enormous sums of money lost through industrial disturbances.

"It is estimated," said he, "that last year the total income of all unions of the country was about $184,000,000. On the other hand, the incomes of the various employers' associations, local, State and national, amounted to not more than $6,000,000, or a little over 3 per cent of the income of the unions which are endeavoring to enforce the closed shop system.

"Today the great mass of American production is conducted upon an open shop basis. In 1923 the trade and railway unions had less than 20 per cent of the organizable workers in their membership. The public may think that the unionist system is stronger than these figures would indicate, but that is due to the fact that a few key industries, among them being building, transportation and fuel, are in the grip of the closed shop, and consequently are very much in the public mind.

"The open shop, or American plan of operation, despite the extremely limited funds available for its promotion, is steadily growing wherever understood, but our efforts must be greatly stimulated if such enormous funds are available to offset it, and so many weak-kneed politicians seeking votes are willing to yield to unionist demand.

"Closed shop militant unionism has always meant disturbance, and from 1916 to 1923 inclusive the loss from industrial strikes aggregated over $12,500,000,000. The loss to the employers was $478,500,000. The loss to the employees was $1,740,000,000, and the loss to the public was estimated at over ten billion dollars."

Quenching Media for Heat-Treatment

During the past month work has been in progress at the Bureau of Standards to determine which of the governing factors in aqueous quenching solutions are the predominating ones, so that predictions as to the solution and its concentration giving the desired cooling velocities can be made.

Motion pictures of samples, during actual quenching, on which regular cooling curves are being obtained, have been taken by using a suitable glass quenching tank.

Apparatus is being designed and built for pressure quenching as a means of getting increased rates of cooling for given solutions, and for making emulsions of oil and water without the use of air so that rates of cooling intermediate between oil and water may be obtained.

Railroad Car Loadings at Peak

Four successive weeks have shown loading of revenue railroad freight in the United States at 1,102,336 cars, 1,112,345 cars, 1,073,430 cars and 994,504 cars—the two first being the largest weekly figures ever recorded. The total for the latest four weeks (ended Nov. 8), five weeks, six, seven, eight, nine and ten weeks successively, has been higher than for any corresponding previous sequence of weeks. For these ten weeks of 1924 it amounted to 10,594,486 cars; for the same ten weeks of 1923 it was 10,529,985 cars; and 1923 showed the largest total freight movement of any year in our history.

National Tube Co. is relining and revamping its No. 1 blast furnace at Riverside works, Benwood (Wheeling), W. Va., and expects to have this stack ready for operation soon after the turn of the new year. No. 2 furnace at this plant is in production, but the iron is being laid down, as all other departments of this plant are idle.

BOLT AND NUT STANDARDS

Meeting of Members of Standardization Bodies May Lead to International Standards

A step which may lead eventually to the establishment of a world standard for bolts and nuts was taken at a conference held in New York, Oct. 28, under the auspices of the American Engineering Standards Committee. Representatives of German, Czechoslovakian and American national standardizing bodies were present.

The conference discussed the advantages and disadvantages of the so-called "United States" standard, which is the basis of the present standards adopted in Germany and other Continental countries, and also the present "shop standard" and the proposed American standard. A general international conference to discuss uniformity in wrench openings was proposed. Tolerances for round stock and the quality of material used for bolts and nuts were other matters taken up.

Soon after the world war the Germans adopted national standards for bolts and nut diameters and corresponding wrench openings. Similar action was taken in Austria, Holland, Sweden and Switzerland, which followed the German work in the principal dimensions, with the result that nuts, wrenches and boltheads are interchangeable in these countries. It is thought that Czechoslovakia, Hungary, Norway, Poland and Russia may also adopt the German standards.

In the United States, a large amount of work has been accomplished in the last two years by a large sectional committee on bolt, nut and rivet proportions, under the sponsorship of the American Society of Mechanical Engineers and the Society of Automotive Engineers.

The "United States Standard"

In adopting their present standards, the Continental countries thought they were following American practice. Essentially what they did was to follow the so-called "United States Standard," rounding the wrench openings to the nearest millimeter. It was natural perhaps for the Europeans to assume that these represented actual American practice, because they are widely quoted in text books and handbooks, under the title of "United States Standard Bolts and Nuts." The American representatives stated that in fact these now represent less than 3 per cent of the production in this country.

The bulk of the present production, except in the automobile and agricultural machinery industries, follows what are called "shop standards" which have heads and nuts about 1/16 in. smaller than the so-called "United States Standard." The American subcommittee after extensive study and cnoference has proposed a series which is still smaller by about 1/16 in.

In discussing the three systems, the Americans presented the results of extensive tests, most of which were carried out by the Bethlehem Steel Co., and which show conclusively that the proposed series of nuts are in all cases much stronger than the thread on the bolts. The Germans reported similar results from investigations which they had carried out. The Americans further pointed to the experience of the automobile and agricultural machinery industries as confirming the soundness of their proposed standards.

The European representatives stressed the importance of the export trade and the unsatisfactory conditions which result from competing national standards. They emphasized also the difficulty and expense which would be entailed if they were to change their standards which have now been adopted extensively throughout Continental Europe.

Same Wrench Opening for Nut and Bolt Head

The Europeans stated that in the Continental countries the opinion was strong that the same wrench opening should be used for the nut and the bolt head. In many sizes, the prevailing American practice is to make the head 1/16 in. smaller than the nut, but in the proposed series, they will be the same in most sizes. It was unanimously agreed that world-wide uniformity in wrench openings is so important that it would be desirable to discuss the matter in the near future in a general international conference.

Tolerances for round stock and the quality of the material used were other questions discussed, and in this connection it was interesting to note that while the American bolt and nut manufacturers use material with a manganese content up to 0.60 per cent and a phosphorus content not over 0.10 per cent, the German manufacturers use a material containing no manganese and up to 0.40 per cent phosphorus.

To Open Bids for Shop Equipment for St. Louis High School

The Board of Education, St. Louis, R. M. Milligan, commissioner of school buildings, Ninth and Locust Streets, will open bids Dec. 3 for the following direct motor-driven equipment for the manual training department of the new William Beaumont High School:

Eighteen 14 in. x 6 ft. screw-cutting engine lathes and two 18 in. x 8 ft. screw-cutting engine lathes, similar to those produced by the Monarch Machine Tool Co., the Sebastian Lathe Co. or the Sidney Machine Tool Co.

Three 11 in. x 4 ft. speed lathes, with variable-speed motor drive.

One 9 in. x 4 ft. screw-cutting lathe, floor type.

One plain head turret lathe, with at least ⅞ in. stock capacity, similar and equal to Milholland No. 2.

Two universal milling machines, with 2 in. feed, transverse 7½ in. and vertical 18 in., equal to Brown & Sharpe No. 1½.

Four 16 in. back-geared shapers, similar to the Rockford.

One 24 in. sliding head vertical drilling machine, with positive geared feed, similar to the Sibley 24 in. heavy pattern.

One 20 in. back-geared drill, motor driven.

Two 14 in. sensitive drills of the Leland-Gifford type.

One 8 x 24 in. universal tool grinder, similar to the No. 1 of the Willmarth & Morman Co.

Four water tool grinders, equipped with 16 in. x 2 in. x 1¾ in. grinding wheels, similar to the Clark grinder.

One wet drill grinder for drills from 3/32 in. to 1½ in., with 9½ in. diameter grinding wheels, of improved new Yankee type.

Two power hack saw machines from 0 to 6 in. capacity, of the E. C. Atkins Kwik Kut type; the Racine, of the Racine Tool & Machine Co. or the Peerless or the equal.

One arbor press of the pedestal type, with 4 in. maximum capacity.

One 24 in. x 24 in. x 6 ft. planer, equal to that of G. A. Gray Co., the American Tool Works Co. or the Cincinnati Planer Co.

One 1-ton portable crane, not less than 6ft. high.

One movable jack with a lifting capacity of 4000 lb.

One combination arbor press, straightening and truing-up machine 32 in. wide and 67 in. high and of 30 tons minimum capacity.

One oxy-acetylene welding and cutting apparatus, Meco type D, or a No. 1 Imperial welding outfit.

One 1-ton differential chain hoist, with 12 ft. lift.

One 1-ton steel plate trolley, Ryerson or equal, adapted for 8 in. I-beam.

Twenty-nine wood turning lathes, 12 in. swing and 24 in. between centers and 1 lathe with 12 in. swing and 36 in. between centers, of the Oliver Machinery Co.'s No. 53A or equal.

One wood trimmer cutting 5¾ in. deep and a stroke of 15 in.

One universal saw bench, base 30 x 40 in.; table working surface, 41 x 44 in.; stationary table, 24 x 44 in.; rolling table 17 x 44 in.; with capacity to cutrip to 26 in., cut off to 36 in. wide and to cut material 1⅛ in. thick.

One 24 in. single surface wood planer.

One punching and shearing machine, capacity ⅞ in. round, ⅝ x 2 in. and ¼ x 4 in. flat iron.

A display of spur and worm gear speed reducers will be made by the Foote Brothers Gear & Machine Co., Chicago, at the National Exhibition of Power and Mechanical Engineering at the Grand Central Palace, New York, Dec. 1 to 6.

European Markets Show Improvement

British Prices Move Upward—Continent Shows Strong Tone—German Raw Steel Syndicate Moves to Reduce Output

(By Cable)

LONDON, ENGLAND, Nov. 17.

PIG iron is quieter after recent heavy sales, but prices are firm on restricted supplies. Export demand for Cleveland foundry iron is still poor, but home demand is absorbing the current output. Hematite is in improved demand, and home and export prices are firm. The North Lonsdale Iron & Steel Co., Ltd., Ulverston, Lancashire, is relighting its second furnace—the first increase in West Coast production in nine months.

Ferromanganese is firmer on account of lessened pressure on the part of Norwegian producers to depress prices.

Foreign ore is slightly more active. North African grades are sold at 20s. to 20s. 6d. ($4.62 to $4.74). Bilbao Rubio is held nominally at 21s. 6d. to 22s. ($4.97 to $5.08), both ex-ship Tees.

Finished steel is dull for export generally, especially ordinary merchant sales, but domestic demand is improving. Prices are unchanged, with a firmer tendency. The Barrow Hematite Steel Co., Ltd., Barrow-in-Furness, has secured an order from New Zealand for about 10,000 tons of rails.

Pig iron exports in October were 41,541 tons, of which 6099 tons went to the United States. The total exports of iron and steel were 309,205 tons.

Sheets and Tin Plate

Tin plate is quiet but firm at scheduled prices. Some works are in want of prompt specifications; others are fairly well placed.

Galvanized sheets are strong on recent heavy merchant sales. Export demand still is languishing. No. 24 gage corrugated bundles are being sold at £17 10s. (3.61c. per lb.) f.o.b. Makers generally are offering January as the earliest delivery.

Black sheets are stagnant.

On the Continent of Europe

Continental markets are strong on recent sales of semi-finished steel from all countries, amounting to about 150,000 tons. Makers are fully sold to the end of the year, and many are unwilling to quote. Billets are being done at £5 10s. ($25.41) f.o.b. Sheet bars are being sold in good quantities at £5 12s. 6d. ($26) f.o.b. Wire rods are being done at £6 12s. 6d. ($30.60) f.o.b. and up to £7 ($32.34) is now asked.

Pig iron sellers are scarce, owing to ability to obtain good prices on other Continental markets. Finland is paying Luxemburg up to £4 ($18.48) f.o.b. for foundry grades.

Finished steel is less excited, but prices still are rising. Germany is negotiating other "trusts." Wire rod makers are endeavoring to fix minimum prices. German merchants are buying heavily of semi-finished material in Belgium, France and Luxemburg, in view of the restriction on imports after Jan. 10 next.

The German raw steel "trust" is planning to reduce the output of raw steel by 20 per cent in December.

German Iron and Steel Active

(By Radiogram)

BERLIN, GERMANY, Nov. 17.—Steel ingots are now held at 100 gold marks per metric ton ($24.20 per gross ton). Steel bars are 122 marks (1.32c. per lb.). Thin steel sheets are 195 marks (2.11c. per lb.). The market is much more active and prices are tending upward.

British and Continental prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at $4.62 per £1, as follows:

Durham coke, del'd	£1	5s.				$5.78		
Bilbao Rubio ore†	1	4				5.54		
Cleveland No. 1 fdy	4	7				20.10		
Cleveland No. 3 fdy	4	1½	to £4	2s.		18.83	to	$18.94
Cleveland No. 4 fdy	4	1				18.71		
Cleveland No. 4 forge	4	0				18.48		
Cleveland basic	4	0				18.48		
East Coast mixed	4	9				20.56		
East Coast hematite	4	19	to 5	0		22.87	to	23.10
Ferromanganese	14	10				66.99		
*Ferromanganese	14	0	to 14	10		64.68	to	66.99
Rails, 60 lb. and up	8	10	to 9	0		39.27	to	41.58
Billets	7	10	to 8	5		34.65	to	38.12
Sheet and tin plate bars, Welsh	8	12½				39.85		
Tin plates, base box	1	3½				5.43		
						C. per Lb.		
Ship plates	9	0	to 9	10		1.86	to	1.96
Boiler plates	13	0	to 13	10		2.68	to	2.79
Tees	9	2½	to 9	12½		1.88	to	1.98
Channels	8	7½	to 8	17½		1.73	to	1.83
Beams	8	2½	to 8	12½		1.68	to	1.78
Round bars, ¾ to 3 in.	9	7½	to 9	17½		1.93	to	2.04
Galv. sheets, 24 gage	17	10				3.61		
Black sheets, 24 gage	12	10				2.58		
Black sheets, Japanese specifications	15	5				3.15		
Steel hoops	10	15	and 12	10*		2.22	and	2.58*
Cold rolled steel strip, 20 gage	16	0				3.30		

*Export price.
†Ex-ship, Tees, nominal.

Continental Prices, All F. O. B. Channel Ports

Foundry pig iron: (a)								
Belgium	£3	14s.				$17.10		
France	3	14				17.10		
Luxemburg	3	14				17.10		
Basic pig iron: (a)								
Belgium	3	11				16.40		
France	3	11				16.40		
Luxemburg	3	11				16.40		
Billets:								
Belgium	5	12½				26.00		
France	5	12½				26.00		
Merchant bars:						C. per Lb.		
Belgium	6	0	to £6	5s.		1.24	to	1.29
Luxemburg	6	0	to 6	5		1.24	to	1.29
France	6	0	to 6	5		1.24	to	1.29
Joists (beams):								
Belgium	6	0				1.24		
Luxemburg	6	0				1.24		
France	6	0				1.24		
Angles:								
Belgium	8	0	to 8	5		1.65	to	1.70
¼-in. plates:								
Belgium	7	5				1.50		
Germany	7	5				1.50		
⅜-in. ship plates:								
Luxemburg	7	5				1.50		
Belgium	7	5				1.50		

(a) Nominal.

DEPRESSION IN BELGIUM

Less Activity in Iron and Steel—Prices Lower and Production Has Declined

BRUSSELS, BELGIUM, Oct. 29.—Belgium's heavy industry has of late shared in the general depression, with weak prices, and a tendency toward reaction in output, especially in coal. At the autumn meetings of the iron and steel corporations German underselling was complained of, but it seems that Belgian producers have quite as often undersold Germany. The effect of the 8-hr. day and of high wages, which since 1914 have risen more than the cost of living, is complained of.

The Belgian State has granted to two important concerns considerable credits to enable them to execute overseas orders on deferred payment lines. One credit was of 6,000,000 fr. for an order from Colombia for railroad material; and a second syndicate, consisting of Cockerill-Seraing and Ougrée-Marihaye, obtained a State credit of 7,000,000 fr. for an order of 11,000,000 fr., also from Colombia.

Prices have declined, but are very irregular. Foundry iron No. 3 fell from 340 to 345 fr. per metric ton on Sept. 1 to 335 to 340 fr. early this month. For semi-finished goods English buyers have long offered prices far below those demanded by the producers, but of late the latter have ceased making concessions. Bars fell 10 to 15 fr. a ton in September, and in October reached 530 to 535 fr.

The depression is sharply expressed in the shrinkage in coal output:

	Metric Tons	
Monthly Average	Coal	Coke
January to June, 1924....	2,049,000	358,000
July	1,973,000	354,000
August	1,702,000	337,000
September	1,569,000	306,000

The number of employees in the coal and coke branch has fallen by 40,000 since the first half of the year. Receipts of reparations coal in 1923, as reported by the Comptoir belge de Repartition, totaled 1,574,307 metric tons, against 2,829,213 tons in 1922. With the end of Germany's passive resistance, and with the conclusion of the agreement between the Ruhr corporations and the "Micum," the reparations coal deliveries again increased, and in March this year reached their highest point at 531,100 tons.

Iron and Steel Less Active

In the first half of 1924 Belgium's iron and steel industry was still favored by the after-effects of the Ruhr crisis, the best month being May, but in the third quarter selling activity declined. Factors in this were exchange conditions and Germany's reappearance in the world market. This is only slightly visible in the production figures, because the concerns have tried to avoid discharging workmen and reducing output, owing to the resulting increase in production cost. Only one blast furnace has been blown out. Production in metric tons was:

Monthly Average	Pig Iron	Raw Steel	Finished Steel	Blast Furnaces in Operation
Jan. to June, 1924.	228,028	228,968	197,291	45
July	247,380	238,490	202,850	49
August	244,310	231,230	194,126	49
September	238,750	237,930	193,176	48
Total Jan. to Sept..	2,098,610	2,081,460	1,774,690	..

The whole foreign trade balance of Belgium, including Luxemburg, remains passive, imports in the first half of 1924 being 8,559,597,000 fr. against 5,781,274,000 fr. in the same half of 1923, while exports were 6,716,549,000 fr. against 3,807,570,000 fr. Foreign trade in the chief products of the heavy industry in the first half of 1924 were:

	Metric Tons	
	Imports	Exports
Coal (including reparations)	4,406,409	1,101,431
Coke	1,179,901	375,582
Iron ore	4,259,041	667,443
Scrap iron	95,279	50,382
Pig iron	195,213	57,737
Ingots, blooms, etc.....	51,109	365,378
Rails	5,947	131,344
Wire rods	25,779	42,775
Tubes	6,984	8,751

PRICE COMPETITION SERIOUS

Luxemburg Costs High—Export Freight Charges a Handicap

LUXEMBURG, Oct. 24.—The market situation has not improved in the least since September. Prices are noticeably weaker, as well as trading. Owing to the uncertainty of the future buyers are somewhat cautious, inasmuch as German competition has increased of late. The slight price concessions granted by producers have brought about a decline of quotations expressed in francs, in spite of the rising trend of sterling in September. On the export market the competition of the Westphalian plants has been more open and prices low; thus our industrialists mainly concentrated their efforts on securing the necessary orders to keep their mills in operation.

The political situation in China and stringency of money from which both India and Japan are suffering have caused some perturbation in our commerce with the Far East and imposed the greatest circumspection in our business relations with these countries. On the other hand, our export transactions are greatly handicapped by the high cost of freight at Antwerp, while our nearest competitors, the Lorraine ironmasters, are able to ship their products through Dunkirk at much cheaper rates.

These factors have accentuated the crisis through which our market has been living for several months and the future is looked upon with some apprehension.

Prices Are Less Favorable

In spite of a few more inquiries for export, prices are less favorable. The ruling quotation for chill-cast No. 3 iron stands at 325 to 330 fr. ($15.65 to $15.89 per gross ton); basic, 68 to 69 fr. f.o.b. Antwerp. Producers' quotations for semi-finished steels are lower on the London market than f.o.b. Antwerp; thus, blooms stand at £4 13s. 6d. to £4 15s. ($21.32 to $21.66); billets, £4 16s. 6d. to £4 17s. 6d. ($22 to $22.23); largets, £5 to £5 2s. 6d. ($22.80 to $23.39). Keen competition exists among Belgian, Lorraine and Luxemburg plants for beams and bars. The German asking prices for bars are: £5 7s. 6d. to £5 8s. 6d. (1.09c. to 1.10c. per lb.), against Luxemburg and Belgian rates of £5 8s. 6d. to £5 10s. (1.10c. to 1.12c.) for beams and £5 10s. to £5 11s. (1.12c. to 1.13c.) for bars. Owing to this competition British importers refuse to purchase above £5 5s. to £5 7s. 6d. (1.07c. to 1.09c.), and the impression is that exporters will soon yield.

Sheet Shipments Large in September

While sales of independent sheet manufacturers fell off slightly last month as compared with the month before, reflecting the preelection hesitancy, shipments, which really tell the story of business, continued the increasing tendency which started in July, going 39,561 tons ahead of those for September, 42,273 tons ahead of those for August and substantially approximating the deliveries in October last year, a month of good shipments. Production also was unaffected by the lighter sales, running almost 30,000 tons more than of September and about 57,000 tons more than August. Unfilled orders of the mills reporting were slightly larger on Oct. 31 than one month before. Sales in October represented 70.7 per cent of the capacity embraced by the report; production, 78.9 per cent; shipments, 73.3 per cent; unfilled orders, 88.0 per cent; unshipped stocks, 24.2 per cent, and unsold stocks, 13.6 per cent.

Figures in net tons for October compare with those of the two preceding months and October last year as follows:

	1924			1923
	October	September	August	October
Capacity	431,000	413,000	401,700	424,000
Per cent reporting.	72.6	70.0	72.7	69.5
Sales	221,773	227,520	207,986	185,110
Production	247,222	217,981	190,436	225,714
Shipments	229,771	190,210	177,498	230,820
Unfilled orders....	275,953	274,325	236,614	307,540
Unshipped stocks..	75,862	81,570	70,094	71,902
Unsold stocks.....	42,685	43,001	42,625	34,942

CANADIAN ACTIVITIES

Substantial Railroad Orders Expected Soon—Blooming Mill Resumes

TORONTO, Nov. 18.—To provide for several small orders for steel, two open-hearth furnaces have been put in operation by the British Empire Steel Corporation, at Sydney, N. S. The orders call for only about 2500 tons and will have little effect on the employment situation at the plant where between 1300 and 1400 men are employed at present. It is expected, however, that this business is but the forerunner of a general improvement in the Canadian iron and steel industry and orders of an extensive nature are expected to appear within the next few weeks.

Advices from Montreal indicate that within the next two weeks the Canadian Government will let substantial railroad equipment contracts with a number of Canadian companies. It is understood that the British Empire Steel Corporation and the Algoma Steel Corporation will both receive rail contracts, while several of the car equipment companies, including the Canadian Car & Foundry Co. and the National Steel Car Co., are expected to receive sufficient business to keep their plants busy for some time. According to Vice-President McLurg of the British Empire Steel Corporation, there is no prospect for an early rail order from Newfoundland, as the Reid Newfoundland interests have decided not to replace steel rails until next summer.

Operations at the blooming mill of the British Empire Steel Corporation, Sydney, N. S., were resumed Nov. 17. The blooming mill will be engaged for two weeks in replacing wire and nail stocks at the plant, and the two open-hearth furnaces will continue in operation during that period. The No. 8 blast furnace was banked Monday, Nov. 10, but the men employed there will be taken on in the blooming mill department.

The British Empire Steel Corporation, operating iron mines at Bell Island, is planning a partial shutdown for the winter because contracts for sale of iron ore for the year 1925 have not yet been made. One of the four operating mines was closed down Nov. 3, throwing 200 men out of work, but arrangements have been made to carry them temporarily in connection with the loading of steamers with the remainder of this year's shipments of ore for foreign markets, about 200,000 tons having still to be shipped, of the 850,000 tons bought for 1924. After the 15th of next month another mine will close down and it is unlikely that for the winter months more than 1000 men will be employed as against 2000 in the height of the season's operation this year. For the past two or three years the British Empire Steel Corporation has made extensive ore sales to Germany, but with the improvement of conditions internationally and an accord with France and Germany, it is probable that France will become an increasing competitor in the iron ore market, and on this account the British Empire Steel Corporation is somewhat disturbed as to what may happen after the first of the year. Up to the present no large contracts have been made for ore delivery during 1925. The requirements at the Sydney, N. S., works of the British Empire Steel Corporation are small in view of the fact that the steel plant has been on a part time basis for some time, but with the prospect of contracts being placed by the Canadian Government for rails the outlook for the future is somewhat brighter than it was a few weeks ago.

JAPAN BUYS RAILS IN EUROPE

Japanese Domestic Prices at Low Level as Government Works Offer from 50,000 Ton Stock

NEW YORK, Nov. 18.—Export trade, unlike the domestic market, shows no signs of immediate improvement, although prices on most products exhibit greater strength than formerly. Business with China continues quiet, but with peaceful conditions returning there, exporters look forward to a gradual improvement in demand next year. Japanese buyers are evidently interested in purchasing sheets and tin plate for delivery prior to the expiration of the Conventional Tariff, March 10, but the low exchange rate on the yen and the firm prices quoted by sellers here, are not conducive to much activity. A few small purchases and inquiries for small lots of tin plate continue, 500 to 1000 boxes being the usual transaction and there are a fair number of sheet inquiries current. Tin plate prices continue to exhibit an upward tendency and it is doubtful if better than $6.05 or more per base box could now be done on prime plates, per 100 lb. box. Sheets range from $91 to $92 per ton, c.i.f. Japan, for the light gages.

At present No. 28 gage sheets are selling in Japan for about $68 to $70 per ton, compared with the current delivered quotation of American sellers for this gage of $86 to $88 per ton, c.i.f. port. Stocks are still reported fairly large and the market weak. The Imperial Government Steel Works has lately been working for stock and is reported to be rapidly approaching a stock on hand of 50,000 tons of material. Offers of bars and shapes of open-hearth steel at 115 to 120 yen per ton have failed to obtain business in a quiet market.

The only recent purchase by Japanese interests of any size was the award of the 11,000 tons of rails and accessories by the Imperial Government Railways, Nov. 11. The entire tonnage was placed with Takata & Co., Tokio. The tonnage was divided between Continental and an American mill; 4000 tons of 60-lb. rails with 150 tons of splice bars and 6000 tons of 75-lb. rails with 300 tons of splice bars, going to the La Providence Works in Belgium at a price said to have been close to $32 per ton, c.i.f. Japanese port, and the remaining 470 tons of 100-lb. rails with 33 tons of splice bars, going to an American bidder at a price said to have been better than $38 per ton, c.i.f. Japan.

Scrap Being Shipped from Youngstown to Pittsburgh District

YOUNGSTOWN, Nov. 18.—Indications are that some scrap is leaving yards of dealers in this territory for delivery in Pittsburgh and other adjacent consuming centers. Although there has been considerable scrap buying in the Pittsburgh district, melters in the Youngstown territory still feel that prices are out of line, and being well supplied with stock piles, are not disposed to enter the market in any active way at current levels.

An appraisal of the scrap market in this district reveals current prices of $19.50 for heavy melting and $17.50 for hydraulically compressed sheets. These prices are 50c. to $1 per ton less than are being quoted at Pittsburgh. Certain of the important melting interests at Youngstown are dubious whether quotations would remain at prevailing levels if buying should develop in any substantial way.

The more important melters are well fortified with respect to scrap requirements for some time to come, and are disposed to consume pig iron in relatively larger tonnage in their furnaces rather than pay a price for scrap higher than iron. The above quotation for heavy melting is 50c. higher than the local market on basic iron. In the meantime dealers who loaded up with high-priced stocks the past few weeks are seeking an outlet in other territories, with some measure of success.

An examination for junior physicist will be held throughout the country on Jan. 7, 1925, to fill vacancies in the Bureau of Standards, at an entrance salary of $1,860 a year. Application blanks may be obtained from the United States Civil Service Commission, Washington.

CONTENTS

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Post-War Period Passed

IN the six years that have passed since the Armistice, it may seem from some viewpoints that not a great deal has been accomplished, but from another viewpoint reasonable progress has been made. The difference, lying in the viewpoint, depends on whether we retain the old idea that the post-war period involves reconstitution by reversion to pre-war conditions or that our living nowadays involves adaptation to new conditions just as living always has done.

When the matter is put in that form, it is impressively realized how much progress we have made, for the notion of reverting to pre-war prices, conditions of labor and other circumstances seems quite old, yet it is only a very few years old. Nowadays we are all looking to the future. The memory of pre-war conditions, if not dim, certainly seems very distant, yet five years ago that is what most of us were thinking of. The rest were thinking of entirely new conditions, purely the creation of the war. Both were wrong.

It is helpful to a full realization that we are living simply in new times (not in times the mere result of there having been a great war), to reflect upon the changes that have occurred in our material circumstances. There are a dozen times as many automobiles in the United States as before the war, and the great change the automobile has made in ourselves and in our habits is everywhere recognized. The radio, now nearly universal in use, is purely the creation of the past few years. Our highways, our medical and hospital service, our educational facilities, are greatly improved.

On the other hand, some conditions are not so satisfactory. Things are not as they were before the war and now we do not expect that they ever will be. While the great watchword of business nowadays is "service," the householder cannot get little things done for him as he could before the war, and we do not now expect that the time will ever come when he can. He must learn, in many ways, to do it himself.

In the steel industry good progress has been made. We produced 94,000,000 tons of ingots in 1919, 1920 and 1921, while in the three-year period now ending we are making about 114,000,000 tons, or 21 per cent more, and as to profits the three-year periods furnish approximately the same comparison. The quality of steel has improved. The steel industry has abolished the 12-hour day and there is no thought of going back to the old system.

In the industries in general, relations between employers and employees are vastly better than they were in the years immediately after the war and they are much better than they were before the war. This is of particular interest and importance, for it cannot be said that similar progress was being made before the war. Much is left to develop in this matter, but progress is being made, and it is distinctly progress toward new things and not in the least degree a reversion to pre-war conditions.

Publication of Income Taxes

WHEN the provision for publication of the income tax returns was written into the last tax bill at the behest of LaFollette's bloc, there was created in the minds of thoughtful citizens the idea that something very bad was being done. The realization has proved worse than the preconceived idea and there has been a general outcry against an outrage. As a promotion of the false notions whereof LaFollette is the leading exponent, the thing has served no purpose whatsoever. It has been as much a fiasco, nay, a boomerang, as was his railroad valuation adventure. Superficially it has done nothing but to pander to public curiosity and provide titbits for gossip at the cost of a gross invasion of private rights.

Looking beneath the surface, however, certain things are to be discerned. The first is that the tax returns do not reveal true incomes after all. Some men who are known to have large incomes are recorded as having paid very small taxes. The obvious explanation is, of course, that they had invested largely in tax exempt securities, that they

had large write-offs for capital losses, or that they had incorporated themselves.

On the other hand, some men appeared as having paid surprisingly large taxes. Without any doubt these were ascribable in some instances to the realization in one year for several years of work, a condition that not infrequently obtains among professional men. In fact, this has long been a real grievance among some of them, such as authors, who have pleaded for the assessment of their taxes on average income for a series of years, as is done in Great Britain.

A revelation that has excited much discussion is that of the Amoskeag Mfg. Co., which paid a large income tax, but for its fiscal year nearly coincident with the calendar, or taxable, year reported to its stockholders such a loss that it felt constrained to suspend dividends and soon afterward to make a 10 per cent reduction in wages. Following this disclosure, some of the stockholders charged that they had been deceived, while labor leaders declared that they had been hoodwinked. The company has not yet offered its explanation, but if it should prove to be that the Government rules for accounting caused a paper profit to appear while commercial accounting showed an actual loss—that would not be surprising, for this would not be the first corporation, or individual, who has been required to pay an income tax on a loss.

Analogous to this is the case of the Virginia-Carolina Chemical Co., now in the hands of a receiver, which the Government is suing for underpayment of income tax in a fat year, although the large sum that it then paid contributed toward putting it into receivership and the probable loss of its property by the stockholders.

If the publication of income taxes in detail serves to draw public attention to such injustices and monstrosities, a useful purpose will have been served, but it will not be that which Senator LaFollette intended. This is the first reaction to the outrage, which is now alleged legally to have been contrary to our very Constitution. But there is a second and deeper reaction, which involves our income tax system itself.

What thoughtful person can scan the long lists of their fellow citizens who are required to pay many thousands of dollars annually to the Federal Government without asking why should there be such a system? Why should one man be required to surrender a fourth of his earnings while many more men are not asked to contribute anything? The Government does not do any more for either than to provide equal opportunity. Indeed, if the large earner be associated with "big business," the Government harasses him first and then skins him afterward.

Is not the only answer this: The present political theory is that those who are the most capable should pay most for the cost of government and the strong arm of the majority will compel it. Professional men of large earning power are taxed excessively. This is applauded, ignorantly, by millions of our fellow citizens, and not even did Mr. Mellon in his program for tax revision venture to propose anything different. This is the first practical step that is recommended by socialistic economists, like Hobson. Yet both in the recent British and American elections the forces of socialism were repelled by very large popular majorities. We hope that this does not mean a thrusting back of evil for the sake of general welfare with a simultaneous willingness to prey upon a few. We hope rather that it is a reflection of economic misunderstanding that may be removed by exposition and argument.

That International Steel Understanding

SOME of the underlying conditions affecting, and affected by, the long considered allocation of world markets among iron and steel producing nations may properly be reviewed. Progress toward reaching any international understanding is naturally slow, with buying hesitancy world wide and suspicion, distrust and even national antipathies rampant. More or less formal negotiations are going on below the surface, but no one in a position to know speaks with any certainty of the time or nature of the outcome.

Great Britain is in sore need of business and would like to have the stage set for a profitable performance when the world begins buying. With many old plants and strongly entrenched labor unions, the British iron industry is suffering from relatively high production costs, particularly when measured in terms of foreign exchange. She has years of experience in exports, however, numerous commercial contacts and large financial resources. Thus the British feel in a fairly strong position to obtain their share, especially as British spheres of influence are largely concentric with the regions which are consumers of iron and steel.

France has greatly increased productive capacity, partly through acquiring steel plants in former German Lorraine. She faces the necessity of building up an export trade of a new magnitude and has made some progress in this direction. The temporary advantage of the world price of the franc is making it possible for manufacturers in France to do business easily. Many would like to see it stabilized at about 5 cents.

Germany has little productive capacity in iron and steel beyond the normal domestic demand. With common labor at 4 marks 20 pfennig (98 cents) for eight hours, after 50 pfennig are taken for the various forms of insurance, the labor cost item is low, but heavy taxation of the industries might easily make any small increase in wages lose for Germany any present advantage. And wage advances are regarded by many as inevitable with any increase in activity.

British manufacturers at the moment are not strongly united, so meager has been the volume of business for a long time, except in tin plate and steel sheets. Tentative overtures to Germany have been made by individual companies of prominence, but it looks as though an authoritative joint conference would follow an invitation from some independent group, as in Belgium. A general anti-French feeling in Germany militates against a broad union with France, of course, while in France it is a case of suspicion toward any German promises. In all the negotiations there is a feeling that the United States will not participate, but that it will take the position of

big brother, willing to look favorably upon any scheme calculated to live and let live, or to prevent unnecessarily keen competition on the one hand or the setting up of artificial trade restraints on the other.

The industry in Great Britain is decidedly depressed. That in Germany is operating at 60 per cent, but has frequently sold at prices only a little over one-half what is quoted by Great Britain, apparently believing a large margin is necessary to secure orders. Meanwhile France with almost no unemployment and with internal prosperity, is now finding a falling off in demand.

The way is being opened for an internationaal understanding in another direction. Two French purchasers of German plants in former German territory have made private arrangements to obtain the necessary Ruhr coal in return for Lorraine ore, but this appears to be as far as any international working agreements have been made. The one exception is active negotiation looking to stabilizing the prices of steel rails, with participation by practically all of the rail makers of Europe. Before the war there was a European rail agreement apportioning export business. This never worked with entire satisfaction, but the present plan seems not to comprehend a dividing of markets, but merely a stabilizing of prices. Non-producing nations would not then obtain rails at prices way below what railroads in producing countries have to pay. Again, the plan is to come to a settlement without American representation, but Europe considers our costs sufficiently high so that any prices arrived at will be highly competitive for us. Probably, as in the case of the former rail agreements, no attempts will be made to sell standard rails in the United States.

Group Consciousness in Industry

THE importance of group consciousness in industry found emphasis in the recent convention of the American Institute of Steel Construction held at French Lick Springs, Ind. Group consciousness is not to be confused with class consciousness, which is synonymous with the setting of class against class for the promotion of purely selfish ends. It is rather a realization that a given industry can expand its opportunities and at the same time increase its usefulness to the public through united endeavor.

The principal problem of any industry is to find a market for its products. Inasmuch as demand has a definite relation to costs, it is important that economies be effected wherever possible. Through its standard specification for the design, fabrication and erection of structural steel, the institute has taken one important step in that direction, which is now supplemented by a code of standard practice, just adopted. Through the study of uniform cost finding principles, it not only hopes to discourage unintelligent competition but also definitely to locate sources of avoidable waste and loss. As was so aptly expressed by one of the speakers at the convention, the real objective of uniform cost finding is a continuing reduction in costs.

Demand for a product also has a definite relationship to selling skill. It is not enough to reduce costs; it is also necessary to make the best possible presentation of the merits of a product so that it will command employment in the uses for which it is best adapted. Through a pooling of sales ideas, through research work to uncover all pertinent facts regarding structural steel, and through an organized campaign of education, the institute aims to win for the industry the full recognition it deserves.

If the steel fabricators have achieved group consciousness, it is because they believe they will attain a degree of efficiency in production and marketing which is not possible without united effort.

CORRESPONDENCE

Aluminum-Copper-Magnesium Alloys

To the Editor:—I notice that in THE IRON AGE for Oct. 23, 1924, page 1066, in your abstract of the paper, "The Casting and Heat Treatment of Some Aluminum-Copper-Magnesium Alloys," given by Daniels, Lyon and Johnson, before the Institute of Metals Section of the A. I. M. E., at Milwaukee, a point is omitted which is probably the most important. I am calling this to your attention because the heat-treated aluminum-base alloys containing about 4.75 per cent copper with added silicon, and in some cases magnesium, represent a commercial material which will have an increasing field of application.

Given a heat treatment consuming a period of not over 36 hr., an aluminum alloy of this type will attain an ultimate strength of about 30,000 lb. per sq. in., and an elongation in 2 in. of about 5.5 per cent. In some cases test bars have shown as high as 35,000 lb. per sq. in. and 10 per cent. Brinell hardness will range between 60 and 80.

If it is taken into consideration that the material as sand cast will have an ultimate strength of about 20,000 lb. per sq. in., and an elongation in 2 in. of about 2.5 per cent, it will be seen that this material undergoes remarkable improvement through heat treatment. In a good many ways it resembles steel in its behavior. It has its proper temperature and soaking period, its proper quenching medium, its proper aging (drawing) temperature and time of aging. Its behavior during heat treatment is also dependent upon its chemical composition.

This type of alloy is readily prepared and has good foundry properties. Because of its lightness and exceptional properties in the heat-treated condition, it should not be overlooked as a desirable material for engineering purposes where the expense of heat treatment is not a controlling factor.

SAMUEL DANIELS,
Chief, Metals Branch, McCook Field Air Service, War Department

Dayton, Ohio, Nov. 11.

Iron and steel interests on the Pacific Coast are watching developments of the plans of San Francisco organizations to obtain official sanction from the War Department for the construction of a suspension bridge across the Golden Gate to link San Francisco and Marin counties. According to Major J. R. D. Matheson, Army Engineering Corps, Washington, the corps "looks on the proposition favorably, and the Navy Department has no objection to the proposed construction."

The Century Zinc Co. has been incorporated in Ohio by the Youngstown Sheet & Tube Co., Youngstown, to take over the zinc ore holdings acquired from the Steel & Tube Co. of America, and to develop and expand them. Officers of the Sheet & Tube company are incorporators of the new Century company.

PIPE JOINTS FOR GAS MAINS

Experience with Acetylene Welding in Both Steel and Cast Iron Piping

Welding of long pipe lines, both of steel and cast iron, was hailed as the outstanding event of the day by the twenty-fifth meeting of the International Acetylene Association held last week at Chicago. This organization, which is composed of the manufacturers of carbide, carbide lighting and heating equipment, and welding and cutting gases and equipment, has been closely associated with such boards as the Underwriters' Laboratories, National Fire Protection Association, Interstate Commerce Commission and American Engineering Standards Committee in the formulation of codes and standards for the safe and easy application of acetylene lighting and welding. Their yearly gatherings, therefore, are the occasion of an interchange of views on technical matters in connection with their industry.

Management of Long Pipe Lines

G. O. Carter, consulting engineer, New York, told of the engineering problems solved in connection with the 18-in. pipe line constructed during the summer of 1924 by the Magnolia Gas Co. It extends from northern Louisiana across east Texas to the Beaumont refinery, a distance of 210 miles. It crosses two big rivers, many ravines, bayous and swamps. There is not a single mechanical joint in the entire distance, each pipe being joined into the line by oxy-acetylene welding.

Organization problems connected with such a project were of course considerable. That they were well handled is obvious from the results—only five months was required for the entire job. Six complete crews, each consisting of laborers, camp help, teamsters and welders, were in the field at the height of the summer. In all, about 200 welders were selected,, trained and placed on the job. A single weld is more or less of a commonplace; but to execute about 63,000 of them during a short season and in relatively inaccessible timber and swamp land requires much preliminary thought and preparation.

Furthermore, the completed job was subjected to the most severe tests. As a stretch of two or more miles was completed, the ends were closed by a welded cap, and 130-lb. air pressure applied. Each joint was swabbed with soapy water, rapped with a hammer and watched for air bubbles. About half a dozen pin-hole leaks per mile were thus discovered and corrected. Then the stretch was filled with water and the pressure raised to the amount each length was subjected at the steel mill—550 lb. to 900 lb. per sq. in., depending upon its position in the line. Finally, as the pipe was put into the trench and back-filled, the full head of gas was imposed and the pressure continuously observed.

Among the many problems involved in this undertaking, Mr. Carter selected the acetylene supply as being most interesting to the organization addressed. On previous long pipe lines, acetylene was made in generators, mounted on wagons. Three or four welders would work from one generator, and when they had each completed their joint, they would coil up their hose and all move forward with the wagon to a new location. This meant that at least one team and teamster and one generator attendant was continuously required for each squad. Much time was lost in bad weather, when the wagon would stick in the mud or find rough going. Furthermore, the freedom of action of the welders was strictly limited by the amount of hose available.

On the Magnolia gas line, two acetylene generators were mounted on each wagon; two such wagons were assigned each gang. These were moved each evening, being spotted on favorable ground (which might be some distance from the right-of-way) near a water supply, or near a decent road for the water-wagons. No teams or tractors were needed during the day—they were used for other purposes than moving generators—and one generator attendant took the place of four. All four generators discharged into a 2-in. pipe line laid temporarily along the right-of-way. This supply line was welded into 200-ft. lengths, and had plugged outlets for welding stations every 15 ft. As the work progressed, the pipe was disconnected and snaked ahead—this work also being done after shift.

Beside the obvious saving in labor from such an arrangement, it was found that the welding crew was able to work to far better advantage. Instead of being closely tied to their generator, it was possible to regroup them as required by the pipe asembly and the contours of the country. This in itself permitted a notable saving in expense.

Cast Iron Pipe Joints

Problems confronting the gas engineers in city distribution systems differ only in detail from those solved by the officials of the trunk lines. Cast iron pipe, with the bell and spigot joint, has been favored by the former, on account of its permanence—it is a far different matter to repair or replace a pipe under a city street than in an open field. However, the demand for higher distribution pressures and the use of natural gas (which has a destructive action on the yarn caulked into the joint) has presented a real problem to the men in charge of distribution.

Quite recently there has been placed on the market the so-called "centrifugal cast iron pipe," pipe cast in rotating molds. This has proven to be of such superior quality that the difficulty of higher pressures seemed to be removed. However, the joint problem still remained.

H. R. Swartley, Jr., of the Linde Air Products Co., New York, described the latest type of joint. Cast iron pipe with squared ends is butted together as closely as possible, and a ridge of bronze welded to the outside of the joint, extending clear around the pipe like a collar. A very strong alloy is made between iron and bronze, with the result that the pipe may be heavily sledged and beaten down flat without separating the two metals. Since bronze melts at a much lower temperature than iron the welding is done with great rapidity, and without beating the iron pipe to any extent.

Many tests have shown that this new joint is easily made stronger than the pipe itself. (Recently three lengths of 48-in. cast iron pipe, 1¼-in. wall, were bronze welded together and dropped 8 ft. without damage.) Pipe founders have adopted the practice of joining two or more lengths at the mill. The joints easily withstand the rough treatment incidental to shipment, unloading and delivery to the trench. When welded into a continuous line on the surface, it is found that it may be safely lowered into the ground if supported at every fifth joint. Once in the trench, the pipe may be dragged along under street crossings or other obstructions. Such treatment is of course impossible with the bell and spigot joints.

About a dozen lines of varying diameters and lengths were laid in this manner last summer. Cost data is now being assembled. Information is also being awaited with interest on the only remaining question—how will these new lines stand the pulls induced by cold winter temperatures? Isolated breaks may be expected at points of greatest stress; but these once discovered, repaired, or provided with expansion joints, the line should thenceforth be leak proof. Oxy-acetylene engineers thus feel that they have provided the public utility men with the best weapon to combat their large losses through line leakage.

Officers of the Meachem Gear Corporation, Dickerson Street, Syracuse, N. Y., have decided to close the plant as soon as unfilled orders are completed. Machinery, including considerable new equipment installed when the business was moved recently, will be sold. The company was organized in 1917 with capital of $250,000, to manufacture gears for factory purposes. No reason was given for liquidating the company.

Iron and Steel Markets

INCREASED ACTIVITY

Buying Followed by Price Advances

Operations Expand—Some Forward Contracting—Railroad Demand a Feature

Buying of pig iron and the heavy forms of finished steel gathered momentum last week. A rather general advance in prices, of 50c. to $2 per ton in pig iron, of $2 in plates, structural shapes and steel bars, and of $3 in strip and other forms of steel, followed this week.

Pig iron sales of the past week amounted to about 450,000 tons, making the total recorded since Nov. 1 fully 1,000,000 tons. In the week, the Cleveland district led with 165,000 tons, while Chicago reported 100,000 tons; Pittsburgh, 60,000 tons; Cincinnati, 40,000 tons; New York, 35,000 tons and other centers about 50,000. Furnace operators, showing a determination not to sell at the unprofitable prices of recent months, have advanced their quotations from 50c. to $2, but most of the large sales have been made at the quotations of the preceding week and the new prices, as a rule, are untested. With domestic prices advancing rapidly, more interest is shown in foreign iron, and unless prices abroad also advance, importations are likely to be heavy.

The bulk of the bookings in steel was also at prices ruling before the advances and 1924 requirements are now pretty well satisfied. Limited purchases were also made for delivery early in 1925. Demand for first quarter protection is increasing and there is some mill maneuvering to accept contracts as matters of business expediency, but only for three months. The situation is making for strength in the new price levels.

Mill operations are expanding. Ingot output in Pittsburgh and nearby districts is 65 per cent of capacity against 60 per cent a week ago. Three more blast furnaces were blown in in the Chicago district.

Steady expansion in railroad buying continues a feature. The Santa Fe program for 1925 will require 100,000 tons of rails and 25,000 tons of bridge work. The Nickel Plate is in the market for 20,000 tons of rails. Rail bookings of the week totaled 40,000 tons. The Chesapeake & Ohio bought 10,000 kegs of spikes and the outlook of continuing purchases is a factor in a $2 a ton advance in track bolts and spikes and of $1 in tie plates.

In cars, inquiries for 2568 appeared and orders for 4015 were placed. Steel underframes continued active, with 2000 more under inquiry. The Southern Pacific is in the market for 18 locomotives.

Fresh structural projects call for over 45,000 tons of steel, the largest amount in two months, principally railroad bridge requirements. Awards exceeded 25,000 tons, or close to the highest for a week since Oct. 1. The largest item is 8000 tons for a telephone building in St. Louis. Structural bookings in October, according to the Department of Commerce, represented 66 per cent of capacity against 49 per cent for October, 1923. The 10 months this year show about 6 per cent greater tonnage of steel building than the same period last year.

A Lake yard will build a boat taking 5000 tons of steel and another boat is pending. A riveted steel pipe line for Denver taking 2000 tons of plates has been revived.

The activity in steel has spread to wire, but numerous price irregularities have arisen, particularly in the Chicago district, growing out of the abandonment of Pittsburgh basing. In the East plain wire appears firm at an equivalent of 2.50c., Pittsburgh, but wire nails remain generally weak. Concessions are reported also in wire rods.

Sheet mills have built up a substantial backlog in orders for immediate consumption, but forward commitments are not particularly pressing, and the $3 a ton advance made by different independent producers, as to 4.70c. to 4.75c. for galvanized sheets, for example, seems to await action by the American Sheet & Tin Plate Co. in respect to its first quarter selling basis.

Cast iron pipe, declining in demand, has declined in price fully $3 a ton.

A furnace being relighted in England makes the first increase in West Coast production in nine months. British pig iron exports in October were 41,541 tons, of which 6099 tons went to the United States. Total iron and steel exports were 309,205 tons.

Recent Continental sales of semi-finished steel amounted to about 150,000 tons. Makers are fully sold to Dec. 31 and many are unwilling to quote.

The German "raw steel" union plans to reduce raw steel production by 20 per cent in December. German merchants are buying heavily of semi-finished steel in Belgium, France and Luxemburg, anticipating the restriction on imports after Jan. 10.

Finished steel, according to THE IRON AGE composite price, remains at 2.474c. per lb., $6 per net ton below the figure of one year ago.

Pig iron, at $19.88, is the highest since June, THE IRON AGE composite price having advanced from $19.54 last week.

Pittsburgh

Higher Quotations on Finished Materials Bring Out Liberal Specifications

PITTSBURGH, Nov. 18.—The iron and steel market here has reflected more fully in the past week than it did in the week before the confidence generated by the result of the recent Presidential election. Not only have business and plant operations improved but the order books of producers have increased to a point which has made possible a definite step in the direction of restoring prices to a profitable basis.

All of the independent makers of plates, shapes and bars have advanced prices $2 a ton and the Carnegie Steel Co. has gone along with the change. Some of the sheet makers have come out with prices for first quarter of 1925 tonnages and in all finishes save blue annealed sheets prices have been advanced $1 to $3 per

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Nov. 18, 1924	Nov. 11, 1924	Oct. 14, 1924	Nov. 20, 1923
No. 2X, Philadelphia‡	**$23.26**	$21.76	$21.76	$22.64
No. 2, Valley furnace†	**19.50**	19.00	19.50	21.00
No. 2, Southern, Cin'ti†	**22.05**	21.55	21.55	23.05
No. 2, Birmingham, Ala.†	**18.00**	17.50	17.50	19.00
No. 2 foundry, Chicago*	21.00	21.00	20.50	23.00
Basic, del'd, eastern Pa.	20.00	20.00	20.00	22.75
Basic, Valley furnace	19.00	19.00	19.00	20.00
Valley Bessemer, del. P'gh	22.26	22.26	21.76	24.26
Malleable, Chicago*	21.00	21.00	20.50	23.00
Malleable, Valley	19.50	19.50	19.50	19.00
Gray forge, Pittsburgh	**20.76**	20.26	20.76	22.26
L. S. charcoal, Chicago	29.04	29.04	29.04	28.15
Ferromanganese, furnace	**105.00**	100.00	95.00	107.50

Rails, Billets, etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Bess. billets, Pittsburgh	35.50	35.50	36.00	40.00
O.-h. billets, Pittsburgh	35.50	35.50	36.00	40.00
O.-h. sheet bars, P'gh	37.00	37.00	37.00	42.50
Forging billets, base, P'gh	40.50	40.50	41.00	45.00
O.-h. billets, Phila	41.17	41.17	41.17	45.17
Wire rods, Pittsburgh	45.00	45.00	46.00	51.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb.	1.90	1.90	2.00	2.35
Light rails at mill	1.80	1.80	1.85	2.25

Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.32	2.32	2.32	2.67
Iron bars, Chicago	2.10	2.10	2.10	2.40
Steel bars, Pittsburgh	2.00	2.00	2.00	2.40
Steel bars, Chicago	**2.10**	2.00	2.00	2.50
Steel bars, New York	2.34	2.34	2.34	2.74
Tank plates, Pittsburgh	1.80	1.80	1.80	2.50
Tank plates, Chicago	**2.20**	2.10	2.00	2.60
Tank plates, New York	**2.14**	1.94	1.94	2.74
Beams, Pittsburgh	2.00	2.00	1.90	2.50
Beams, Chicago	**2.20**	2.10	2.00	2.60
Beams, New York	**2.24**	2.14	2.19	2.74
Steel hoops, Pittsburgh	2.50	2.50	2.50	3.00

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

Sheets, Nails and Wire,	Nov. 18, 1924	Nov. 11, 1924	Oct. 14, 1924	Nov. 20, 1923
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh	3.50	3.50	3.50	3.75
Sheets, black, No. 28, Chicago dist. mill	3.60	3.60	3.60	....
Sheets, galv., No. 28, P'gh	4.60	4.60	4.60	4.85
Sheets, galv., No. 28, Chicago dist. mill	4.70	4.70	4.70	....
Sheets, blue, 9 & 10, P'gh	2.70	2.70	2.70	3.00
Sheets, blue, 9 & 10, Chicago dist. mill	2.80	2.80	2.80	....
Wire nails, Pittsburgh	2.75	2.75	2.75	3.00
Wire nails, Ch'go dist. mill	2.85	2.85	2.85	....
Plain wire, Pittsburgh	2.50	2.50	2.50	2.75
Plain wire, Ch'go dist. mill	2.60	2.60	2.60	....
Barbed wire, galv., P'gh	3.45	3.45	3.45	3.80
Barbed wire, galv., Chicago dist. mill	3.55	3.55	3.55	....
Tin plate, 100-lb. box, P'gh	$5.50	$5.50	$5.50	$5.50

Old Material, Per Gross Ton:				
Carwheels, Chicago	**$19.00**	$18.50	$18.00	$18.00
Carwheels, Philadelphia	17.50	17.50	17.50	17.50
Heavy steel scrap, P'gh	**20.00**	19.50	18.50	16.50
Heavy steel scrap, Phila.	**18.00**	17.00	16.50	15.50
Heavy steel scrap, Ch'go	17.25	17.25	16.00	14.00
No. 1 cast, Pittsburgh	18.00	18.00	18.00	18.50
No. 1 cast, Philadelphia	**18.00**	17.50	17.50	19.00
No. 1 cast, Ch'go (net ton)	18.00	18.00	17.50	18.50
No. 1 RR. wrot., Phila.	**18.50**	18.00	18.50	17.50
No. 1 RR. wrot. Ch'go (net)	15.50	15.50	14.00	12.50

Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$3.00	$3.00	$3.00	$3.75
Foundry coke, prompt	4.00	4.00	4.00	4.75

Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	**14.00**	13.87½	13.25	13.50
Electrolytic copper, refinery	**13.75**	13.62½	13.00	13.75
Zinc, St. Louis	**6.92½**	6.72½	6.30	6.30
Zinc, New York	**7.27½**	7.07½	6.65	6.65
Lead, St. Louis	8.87½	8.87½	7.82½	6.70
Lead, New York	**9.00**	8.90	8.00	6.95
Tin (Straits), New York	**54.75**	54.37½	50.25	44.25
Antimony (Asiatic), N. Y.	**15.00**	14.00	11.00	9.25

The prices in the above table are for domestic delivery and do not necessarily apply to export business.

THE IRON AGE Composite Prices

Nov. 18, 1924, Finished Steel, 2.474c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 88 per cent of the United States output of finished steel.

Nov. 11, 1924,	2.474c.
Oct. 21, 1924,	2.460c.
Nov. 20, 1923,	2.775c.
10-year pre-war average,	1.689c.

Nov. 18, 1924, Pig Iron, $19.88 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham.

Nov. 11, 1924,	$19.54
Oct. 21, 1924,	19.46
Nov. 20, 1923,	20.77
10-year pre-war average,	15.72

1924 to Date				1923	
High		Low		High	Low
2.789c., Jan. 15	2.460c., Oct. 14		Finished Steel	2.824c., April 24	2.446c., Jan. 2
$22.88, Feb. 26	$19.21, Nov. 3		Pig Iron	$20.86, March 20	$20.77, Nov. 20

ton above the American Sheet & Tin Plate Co. quotation and to an even greater extent as compared with the prices which some of the independent companies recently have been accepting. First quarter prices on strip steel also have been announced and while they amount to little more than a reaffirmation of what producers have been trying to get for some time for hot-rolled, they show a clear advance of $3 a ton on cold-rolled strips.

The effect of these announcements has been to materially stimulate specifications against such tonnage, as buyers have with the mills carrying lower prices. It rather looks now as though the remainder of the year would not see as low an operation of the mills and furnaces as was expected recently, because the inventory season is only a few weeks away. It is looked upon as good practice to show in the inventories material carrying lower prices than the prevailing market.

Ingot capacity in this and nearby districts now is fully 65 per cent engaged as compared with about 60 per cent seven days ago.

The buying movement in pig iron which began to manifest itself around election day has gained momentum in the past week and it is now estimated that fully 60,000 tons of foundry iron, mostly for first quarter shipment, has changed hands. The position of producers naturally is helped by this development and there is a

stronger tendency in prices. The business has been placed all the way from $19 to $20, with the bulk of it moving at $19 to $19.50. Most producers now are asking $20 or more, but there is still some iron available at this writing at $19.50.

A factor in the stronger pig iron situation is a firmer market in furnace coke. Several contracts for first quarter have been written since a week ago, containing the wage scale clause, at $3.25 per net ton at ovens, and now the asking prices range from $3.50 to $3.75. There has been some activity in coking coal for shipment over the first quarter of the year at fairly high prices, but the spot market still is inactive and weak.

The scrap market derives most of its strength from the faith that dealers have in the future of the market, rather than from consumer buying.

Except for continued interest in freight rate revisions, more especially to sections in the West, where Chicago mills are favored with commodity rates, consideration of the passing of the Pittsburgh plus method of quoting has given way in favor of the bright prospects for 1925 business and the possibility of profitable prices. Interesting comment made on the new order is that while the Federal Trade Commission ruling says that it is unfair to collect unpaid freight, it does not apparently regard as unfair the absorption of freight by mills taking business outside their natural territory. An interesting query also has been presented as to whether, if mills not located in Pittsburgh cannot base prices on Pittsburgh, why mills not located in the Chicago area can base prices on Evanston, Ill., and Indiana Harbor, Ind., as is done in the case of pipe.

Ferroalloys.—British producers late last week advanced the price of ferromanganese $5 per ton to $105, c.i.f. Atlantic seaboard, duty paid, and the domestic producers have followed suit. Considerable business was taken prior to the advance at $100 and while $105 now is firmly quoted by both domestic and British producers that price is yet to find basis in sales. Steady demand is noted for spiegeleisen at unchanged prices, but there is not much demand locally for 50 per cent ferrosilicon, prices of which are still rather indeterminate. Producers are quoting $73.50 to 75, delivered east of the Mississippi, but consumers still claim ability to buy from one producer at $70. Prices are given on page 1381.

Pig Iron.—This market has had one of the most active weeks in point of sales that it has had since about a year ago at this time, when there was heavy buying of iron for first quarter of 1924 delivery. The activity has centered very largely on foundry iron, with scattering tonnages of malleable and Bessemer grades, but includes no basic iron. Although makers of the latter grade generally are asking $19.50 to $20 and have rejected bids of less than $19.50, there have been no sales since a purchase reported last week by a Valley consuming interest at $19, Valley furnace. There was one other sale at that figure, but it represented a community of interest transaction and was non-competitive. Sales of Bessemer iron include one lot of 1000 tons at $20.50, Valley furnace, and a couple of small ones at $21. There is no occasion yet to change quotations of this grade, though producers are seeking more money. A considerable part of the business in foundry iron, estimated at 60,000 tons, is represented in the purchases of a large sanitary ware interest which took 30,000 tons of iron for its two local plants and one at Louisville and another at Baltimore. For the latter plant 1000 tons was taken at $22, Sparrows Point, while purchases for Louisville amounted to 9000 tons of Southern iron at $17.50 to $18.50 for No. 2 and 1000 tons of southern Ohio iron at $20.50, Ironton, for No. 2. The remainder was for local plants and was secured mostly at $19.50 with some of it at $19. A large radiator company was able to buy 3500 tons of No. 2 iron for delivery at New Castle, Pa., at $19, Valley furnace. We note a sale of 1000 tons of No. 2 foundry to a maker of railroad car equipment at $19, Valley furnace, and a sale of a like tonnage of malleable to the same interest at $19.50, Valley furnace. The Westinghouse Electric & Mfg. Co. has tried to buy iron for shipment over the first half of next year, but has not closed, as none of the producers is willing to quote beyond the first quarter, although there was one sale of 1900 tons of iron by a Valley furnace at $19.50 for shipment in the first quarter and $20 for the iron to be delivered in the second quarter. Smaller sales, some of which were as high as $20, Valley furnace, have rounded out the remainder of the total. The Carnegie Steel Co. has put on a furnace at its Edgar Thomson Works, and has ordered on one at its Farrell, Pa., works.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.76 per gross ton:

Basic	$19.00 to $19.50
Bessemer	20.50 to 21.00
Gray forge	19.00 to 19.50
No. 2 foundry	19.50 to 20.00
No. 3 foundry	19.00 to 19.50
Malleable	19.50 to 20.00
Low phosphorus, copper free	28.00 to 29.00

Semi-Finished Steel.—Public quotations are the same as those of the past few weeks, or $35.50, Pittsburgh or Youngstown, for large billets and slabs and $37 for sheet bars and small billets, and there is no evidence to contradict these prices as the prevailing ones, except in the case of slabs, a sale of a good-sized lot of which recently was made at around $33.50. Some mills are exacting the extra of $1.50 per ton on small billets, but others are not and it depends largely on the size asked for as to what is charged. On 1½-in. billets the extra usually is obtained, but $37 is not always obtained for 1¾-in. Contract prices for first quarter of 1925 tonnages will probably be announced soon. The American Steel & Wire Co. still is holding wire rods at $46, base, Pittsburgh or Cleveland, but locally has lost much business because of a $45 price of most of the independent companies. The leading Pittsburgh independent is operating at between 70 and 75 per cent of ingot capacity, but the general average of the Johnstown-Pittsburgh-Wheeling-Youngstown area is nearer 65 per cent than 70 per cent. Prices are given on page 1381.

Iron and Steel Bars.—Makers of steel bars in this and nearby districts evidently have accumulated sufficient business in the past week or two to be fairly independent of further bookings for a good operation and effective yesterday all independent companies advanced prices $2 per ton to a base of 2c., base, Pittsburgh, or its equivalent. The Carnegie Steel Co. has followed suit and is naming the same price. There is no evidence yet that more than 2c., base, has been paid and there is no question that 1.90c. was the price on much of the business booked. The higher price will, however, solidify the lower-priced orders and stimulate specifications, since it would be good business to have inventories show steel at a price below the new market price. Iron bars are moving steadily at former quotations. Prices are given on page 1380.

Structural Material.—Having taken a goodly volume of business at the prices recently prevailing of 1.90c. to 2c., base, for large structural beams, makers in this district generally have advanced, effective yesterday, $2 per ton to a base of 2.10c., Pittsburgh. The structural market appears quieter this week, following the large amount of business loosened by the result of the Presidential election. Sentiment with regard to the future, however, remains very cheerful and fabricating companies are looking for a large business for the early part of 1925. An interesting project to local fabricators is that of the University of Pittsburgh, which proposes to erect a 52-story building to house all activities of the college at a cost of $10,000,000. New bridges to span the rivers at Pittsburgh will, it is estimated, take about 18,000 tons of steel, but it will be some time before the masonry will be completed and it will probably be 1926 before the steel will be required. The advance in steel, if maintained, will be helpful to fabricated steel business because it sounds a warning to investors that they cannot well expect lower prices. Prices are given on page 1380.

Plates.—Prices of this product have advanced $2 a ton, keeping with the other major lines, all mills in this district now quoting 1.90c., base, Pittsburgh, while Youngstown makers are asking 2c., delivered at Pitts-

burgh, which means about 1.90c. at mill. The Carnegie Steel Co. has followed this advance, which was initiated by independent companies. It seems to have been prompted less by large bookings than by a desire by makers to get away from unprofitable levels. The firmer attitude of makers east and west, of course, has been a helpful factor. Prices are given on page 1380.

Wire Products.—Orders are running somewhat heavier than was the case recently, but there are so many makers and so many basing points that with a tendency toward concentration of sales efforts in natural territories of the various producers the mills nowhere are filling up at all rapidly. Possibly there would be more progress in that direction if the makers were willing to take first quarter business at today's prices, but the feeling among manufacturers is that prices are too low and they will be able to do better later. There have been efforts by jobbers and manufacturing consumers to place business for delivery after Jan. 1, but without much success. Many mills are quoting delivered prices that make difficult the figuring of a mill base, but in a general way quotations are well observed, save in the case of coated nails, which are selling well below $2.15, base, per count keg, the regular price. Prices are given on page 1380.

Rails and Track Supplies.—Pittsburgh makers of spikes, effective yesterday, advanced prices $2 per ton to a base of $2.80 per 100 lb., for large spikes and $3.10 for small spikes, for carload lots, with an extra of 10c. per 100 lb. for less than carloads. Other track accessories are at recent prices. Fairly good demand is noted. Light rails still are moving slowly, chiefly because the coal industry is not emerging very rapidly from the depression, which now has ruled much of the time since the fore part of the year. The common price on billet light rails is 1.80c., base, mill. Prices are given on page 1380.

Tubular Goods.—Pipe makers are doing a good business in merchant pipe, but oil country goods still are sluggish, except that there is a little more interest in the market now that refiners are taking offerings more freely and the statistical position of that market is helped by the fact that surplus stocks are moving into strong hands. This branch of the steel industry just now is engaged to about 60 per cent of capacity, with the best operation in the butt weld furnaces.

Cold-Finished Steel Bars.—The advance in hot-rolled bars gives a measure of support to prices of cold-finished steel bars and the likelihood that there will be increased firmness to the price of the latter is expected to stimulate buying and specifications. Some producers already note greater interest in first quarter supplies, books for which have been opened at 2.70c., base, Pittsburgh. This price, of course, provides the equalization of freights with competing mills when necessary. Ground shafting still is priced at 3.10c., base, f.o.b. mills for lots of a carload or more.

Sheets.—The American Sheet & Tin Plate Co. has not yet opened its books for first quarter business, and the movement among independent companies in this direction appears to be waiting on the action of the former. Two or three of the independent companies have taken the step and announced their prices of 3.60c. base for black, 4.70c. and 4.75c. base on galvanized and 2.70c. for blue annealed. There is a very fair amount of business for shipment over the remainder of the year, stimulated by both larger consumptive requirements and the possibility that prices may be generally higher by the end of the year. Mill operations are holding up to the recent rate of about 70 per cent of capacity. Prices are given on page 1380.

Tin Plate.—The American Sheet & Tin Plate Co. still defers action on prices for the first half of next year, and business is held somewhat in check by that fact. Current demands do not amount to much, as consumers have contracts to draw upon against their requirements over the remainder of the year. With regard to first half of 1925 prices the prevailing opinion is that present prices will be continued. Mill operations are running about 55 to 60 per cent of capacity.

Hot-Rolled Flats.—An effort to put prices back upon a profitable level is seen in the announcement of first quarter prices by several of the leading producers. On hoops and bands and narrow strips, the price for that delivery has been announced as 2.50c. base, Pittsburgh, on strips from 3 in. to 10 in. wide 2.40c. base, and on stock wider than 10 in. 2.25c. base. These prices to a considerable extent are what a number of mills have been quoting for some little time but have not been altogether successful in obtaining. Business has been on an increasing scale in the past week or so.

Cold-Rolled Strips.—First quarter prices have been announced by practically all the producers under date of Nov. 17 at 4.15c. base, Pittsburgh, an advance of $3 per ton as compared with price now prevailing. The American Steel & Wire Co. has gone along with this change, which means a corresponding increase at Worcester, Mass. The advance in prices is reported to have caused free specifications against unfilled orders carrying the present price. The new price has not been in effect long enough to gage the reaction on the part of buyers.

Bolts, Nuts and Rivets.—Buyers are specifying fairly well to makers in this district, although, as was the case in the previous quarter, there is a tendency to defer shipments against some of the orders to assure a supply of low priced stock in case there are further price advances for first quarter. Pittsburgh makers are pretty well hedged in by the basings at Cleveland and Chicago and find it necessary to absorb freight in going west beyond the limits of their natural territory. Prices and discounts are given on pages 1380 and 1381.

Coke and Coal.—The coke market is slightly stronger than it has been. Closing of two or three good-sized first quarter contracts at $3.25 per net ton at oven, the contracts containing a provision that the buyer will pay a higher price in case the producer has to restore wages to the Frick scale, to say nothing of the stronger pig iron market, has encouraged stronger price ideas among the oven operators. They now are asking $3.50, with the wage clause included, for first quarter shipments, and one or two which have become pretty well filled up as a result of coke and coal sales are talking as high as $3.75. The spot furnace market is holding at about recent levels, but it is not quite as easy to find supplies at $3 as was the case recently. Spot foundry coke is quotable within the recent range, while on first quarter contract $5 to $5.50 are mentioned.

Old Material.—There have been sales of heavy melting steel in the week under review at $20 and $20.50, the latter at Steubenville, but in the past few days, while there has been some flagging on interest by consumers, there has been no modification of the price ideas of the dealers and it is doubtful whether this grade can be purchased for less than $20. There have been sales of compressed sheets as high as $18.50, but the strongest spot in the market is in machine shop turnings, which have sold as high as $16.75, and that price is bid for additional tonnages. Production is not only limited, but outside markets are netting so much better relative prices that little material can be brought into this market even at $16.75.

We quote for delivery to consumer's mill in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

	Per Gross Ton	
Heavy melting steel	$20.00 to	$20.50
No. 1 cast, cupola size	18.00 to	18.50
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.	19.50 to	20.00
Compressed sheet steel	18.00 to	18.50
Bundled sheets, sides and ends	17.00 to	17.50
Railroad knuckles and couplers	21.00 to	21.50
Railroad coil and leaf springs	21.00 to	21.50
Low phosphorus blooms and billet ends	23.00 to	23.50
Low phosphorus plate and other material	22.00 to	23.50
Railroad malleable	17.50 to	18.00
Steel car axles	21.00 to	21.50
Cast iron wheels	19.00 to	19.50
Rolled steel wheels	21.00 to	21.50
Machine shop turnings	16.50 to	16.75
Sheet bar crops	21.00 to	21.50
Heavy steel axle turnings	17.00 to	17.50
Short shoveling turnings		15.00
Heavy breakable cast	17.00 to	17.50
Stove plate	16.00 to	16.50
Cast iron borings	15.50 to	16.00
No. 1 railroad wrought	16.00 to	16.50
No. 2 railroad wrought	20.00 to	20.50

Chicago

Pig Iron Sales Amount to 100,000 Tons—Finished Material Prices Advanced

CHICAGO, Nov. 18.—The continued buoyancy of the steel market, particularly in the heavier finished lines, is reflected in another advance of $2 a ton on plates, shapes and bars. The new quotations cover first quarter shipment and while they represent an advance of $4 to $5 a ton over the prices at which considerable tonnage was placed just prior to election, they are, nevertheless, yielding business in good volume. Both buyers and sellers appear to be united in the belief that still further advances may materialize and hence there is a growing tendency to contract ahead. In some instances, in fact, buyers have covered their needs for four months. These purchases, however, are restricted to conservative estimates of actual requirements, because few consumers are inclined to indulge in speculation following their experiences in 1920.

Among the most encouraging features of the market is the steady expansion of railroad buying. The Santa Fe alone will place 100,000 tons of rails and 25,000 tons of bridge work for 1925. Other roads likewise are going ahead with the most ambitious programs in years. The structural steel market is also unusually active with a heavy tonnage in new work coming out for bids at a time of the year when building ordinarily tapers off.

Pig iron demand is sustained, as indicated by the placing of fully 100,000 tons during the past week, bringing the total for the buying movement up to 300,000 tons. There remains a number of finished commodities, however, which have not yet felt the change in the market situation to the same extent as pig iron and the heavier forms of rolled steel.

Sheet prices are firm and mills are comfortably booked, but there is as yet no rush of buying for extended shipment. Demand for steel pipe is showing the usual seasonal let-up, although to a less extent this year than ordinarily. In wire products, there are numerous irregularities, and it is no exaggeration to say that wire nails, cement coated nails and wire rods are weak. As a result of decreased demand, cast iron pipe has declined $3 a ton.

The operations of local steel mills continue to improve. A leading interest has blown in two more stacks at Gary and is producing steel at the rate of 73 per cent of capacity. A large independent remains on an 80 per cent basis. The Wisconsin Steel Works has blown in its third blast furnace. With the addition of three stacks during the week the number of active steel works blast furnaces has been increased to 21 out of a total of 34 in the district.

Pig Iron.—After a short period of hesitancy following the advance of local iron, buying was resumed and business placed during the week aggregated fully 100,000 tons, bringing the total for the buying movement which started prior to election up to 300,000 tons. It was announced a week ago that the silicon differential for foundry iron, 2.75 to 3.25 per cent silicon, had been advanced from 50c. to $1 above No. 1 foundry. This action was followed by increasing the silicon differential for No. 1 foundry to $1, also, so that the price for the 2.75 to 3.25 per cent silicon grade is now $2 above the base grade, or $23 a ton. Buying has been on such a broad scale that local producers plan to blow in a Federal furnace next week instead of in December, as first planned. The Wisconsin Steel Works, which sells some merchant iron, blew in its third furnace Saturday. Among inquiries still before the trade is one for 1000 tons of foundry for a northern Illinois melter and another for 600 tons of foundry for a local melter. Generally speaking, business now pending is made up of smaller lots, ranging from 100 tons to 500 tons. In appraising the recent buying movement it would appear that buyers covered because they regarded prices as low rather than because of increased requirements. In a few instances users are anticipating their shipments, but on the whole melt in this district appears to be unchanged. Fully 10,000 tons of Southern iron for barge and rail shipment has been sold in this market during the week. This iron, however, has advanced $1 a ton to $23.18, delivered. The silicon differentials on Southern iron remain 50c. as contrasted with $1 on the local product. Sales of charcoal have been heavy, particularly for shipment to the Cincinnati and Pittsburgh districts, and an early advance in that commodity is looked for. Silvery producers are asking $1 a ton more on orders for first quarter delivery, making 6 per cent $28, furnace, and 8 per cent $30.50. No sales at the advanced figures are reported. Electric ferrosilicon, 14 to 16 per cent, has declined $1 a ton.

Quotations on Northern foundry, high phosphorus, malleable and basic iron are f.o.b. local furnaces and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards.

Northern No. 2 foundry, sil. 1.75 to 2.25	$21.00
Northern No. 1 foundry, sil. 2.25 to 2.75	22.00
Malleable, not over 2.25 sil.	21.00
Basic	21.00
High phosphorus	21.00
Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	29.04
Southern No. 2 (barge and rail)	23.18
Southern No. 2, sil. 1.75 to 2.25	$23.51 to 24.01
Low phos., sil. 1 to 2 per cent, copper free	32.50
Silvery, sil. 8 per cent	34.29
Electric ferrosilicon, 14 to 16 per cent	41.42

Ferroalloys.—A number of carload sales of ferromanganese have been negotiated in this district at $105, seaboard. Just prior to the advance last week considerable tonnage was placed at the former quotation of $100. Several lots of speigeleisen, ranging from 100 tons to 600 tons, have been bought at $31, Eastern furnace, or $39.58 delivered, Chicago. There is apparently no more foreign material available through the port of New Orleans, and it is believed that makers abroad have been concentrating on the production of ferromanganese of late to the exclusion of spiegeleisen.

We quote 80 per cent ferromanganese, $112.56, delivered; 50 per cent ferrosilicon, $75, delivered; spiegeleisen, 18 to 22 per cent, $39.58, delivered.

Plates.—Prices have generally advanced $2 a ton to 2.20c., Chicago. This figure is being strictly adhered to and governs new business for both the current and first quarters. Railroad car orders continue to be a source of considerable tonnage and placements by other classes of buyers are also large. Some users are covering their needs over the next four months. A projected riveted pipe line for Denver, involving 2000 tons of plates, has been revived after lying dormant for several months.

The mill quotation is 2.20c., Chicago. Jobbers quote 3.10c. for plates out of stock.

Structural Material.—Following heavy purchases by fabricators for stock, plain material has advanced $2 a ton to 2.20c., Chicago. This quotation also extends over first quarter deliveries and orders for that period are commencing to be placed. While the market situation is lacking in spectacular features, it is steadily gathering strength and buyers are covering their future needs on the theory that further advances may materialize. At the same time, an unusual amount of structural work is coming out for bids, much of it for the railroads. The Santa Fe alone is taking figures on 25,000 tons, representing its 1925 bridge requirements. Bridge work for the Northern Pacific involves 2000 tons, and viaducts for the Yosemite Valley Railroad, 3000 tons. Other large projects include a building at Indianapolis, 6000 tons; irrigation work near San Francisco, 3600 tons, and vault framing for the Federal Reserve banks at Denver and Omaha, 450 tons each. The largest award of the week was 8000 tons for the Southwestern Bell Telephone Co. building, St. Louis, which went to the Mississippi Valley Structural Steel Co.

The mill quotation on plain material is 2.20c., Chicago. Jobbers quote 3.10c. for plain material out of warehouse.

Bars.—Soft steel bars have been advanced $2 a ton to 2.10c., Chicago. In view of the fact that local capacity is practically committed for this quarter, the new figure is, in effect, a first quarter quotation. Already considerable tonnage has been placed for that delivery, although some sellers, believing that further advances are in sight, are not over-anxious to load their books so far ahead. Demand for bar iron has not shown such consistent improvement and prices have shown irregularity, as low as 2.05c. having been done on attractive tonnages. The increasing scarcity of steel for early shipment, however, is making itself felt in freer purchases of iron and this tendency toward substitution will probably become more pronounced in the weeks to come. Advances in scrap, furthermore, are forcing a firmer attitude on the part of sellers of iron. New business in rail steel bars is in good volume, but not so heavy as to warrant an early advance. Concessions below 2c., mill, however, have disappeared.

Mill prices are: Mild steel bars, 2.10c.; common bar iron, 2.10c. to 2.15c., Chicago; rail steel, 2c., Chicago mill.

Jobbers quote 3c. for steel bars out of warehouse. The warehouse quotations on cold-rolled steel bars and shafting are 3.80c. for rounds and 4.30c. for flats, squares and hexagons; 4.15c. for hoops and 3.65c. for bands.

Jobbers quote hard and medium deformed steel bars at 2.50c.

Sheets.—Local mills are operating full and have built up a substantial backlog in orders for immediate specification. Forward commitments are not comparable with those of mills rolling the heavier products, however, and there appears to be no likelihood of an immediate advance in prices.

Chicago delivered prices from mill are 3.65c. for No. 28 black, 2.85c. for No. 10 blue annealed, 4.75c. for No. 28 galvanized. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Jobbers quote f.o.b. Chicago: 3.80c. base for blue annealed, 4.50c. base for black, and 5.50c. base for galvanized.

Wire Products.—The dislocation of business alinements of long standing following the abandonment of Pittsburgh plus is still bearing fruit in numerous price irregularities. A producer located outside Chicago has recently sold wire nails at $2.80, delivered in this city, or 10c. per 100 lb. below the delivered price of the leading interest. Another mill has sold cement-coated nails at the unusually low price of $2.08, delivered, Chicago. A Pittsburgh district independent which had a large trade in the West has cut $2 a ton below the Chicago district mill prices on wire and nails in a number of instances in quoting its regular customers. In fact, such quotations have been made as far west as the Missouri River. Concessions on wire rods have become so common that the ruling price appears to be the equivalent of $47, f.o.b. Chicago district mill.

We quote warehouse prices f.o.b. Chicago: No. 8 black annealed, $3.05 per 100 lb.; common wire nails, $3.15 per 100 lb.; cement coated nails, $2.40 per keg.

Rails and Track Supplies.—The Santa Fe will buy 100,000 tons of rails for 1925 and the program of the Rock Island Lines, while not yet completely worked out, will be a large one. The Nickel Plate is in the market for 20,000 tons and early purchases by the Chicago & Northwestern and the Burlington are expected. Rail orders booked by local mills during the week aggregate 40,000 tons. The Chesapeake & Ohio has placed 10,000 kegs of spikes with the Inland Steel Co. and liberal quantities of spikes and bolts will be placed shortly by the Santa Fe, the Rock Island, the Missouri Pacific and the Baltimore & Ohio. Prices on spikes and bolts have advanced $2 a ton, while tie plates have gone up $1.

Standard Bessemer and open-hearth rails, $43; light rails, rolled from billets, 1.80c. to 1.90c., f.o.b. makers' mill.

Standard railroad spikes, 2.90c. mill; track bolts with square nuts, 3.90c. mill; steel tie plates, 2.35c., f.o.b. mill; angle bars, 2.75c., f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.45c. base, and track bolts, 4.45c. base.

Bolts, Nuts and Rivets.—Specifications against fourth quarter contracts are improving, those from the railroads being particularly liberal. A considerable number of first quarter inquiries for bolts and nuts have been received but sellers are disinclined to extend their present quotations over that period, as they believe market conditions point to an advance. Several large inquiries for the present quarter have been put out by jobbers who did not contract for their full needs. Automobile manufacturers are showing renewed interest in the market and heavier business from that quarter is expected. The implement industry is maintaining 50 per cent operations and is specifying steadily for its requirements. Small rivets remain weak with 70 and 10 and 5 off, Chicago, a fairly common quotation. For mill prices, see page 1380.

Jobbers quote structural rivets, 3.65c.; boiler rivets, 3.85c.; machine bolts up to ⅞ x 4 in., 55 per cent off; larger sizes, 55 off; carriage bolts up to ⅞ x 4 in., 50 off; larger sizes, 50 off; hot pressed nuts, square, tapped or blank, $3.50 off; hot pressed nuts, hexagon, tapped or blank, $4.00 off; coach or lag screws, 60 per cent off.

Hot-Rolled Strip.—Local mills are quoting 2.50c., Chicago, on strips 10 in. and wider, and 2.60c. on narrower sizes.

Cast Iron Pipe.—Prices have advanced to $43, base Birmingham, for 6-in. and larger, although new business continues to lag. Detroit has placed 500 tons each of centrifugal pipe with the National Cast Iron Pipe Co. and the United States Cast Iron Pipe & Foundry Co. and 500 tons of sand cast with the American Cast Iron Pipe Co. The same city takes bids Nov. 24 on 1250 tons of 12-in., class C. Elyria, Ohio, receives figures Dec. 1 on 224 tons of 20-in., class B. The National Cast Iron Pipe Co. was the successful bidder on 150 tons for Madison, Wis., and 300 tons for Higginsville, Mo. In the face of slack business, sellers have failed to sustain their recent advances. Bids received at Park Falls, Wis., yesterday were as follows: $37.20, base Birmingham, James B. Clow & Sons; $40, Birmingham, United States Cast Iron Pipe & Foundry; $40, Birmingham, National Cast Iron Pipe Co. The quotation of the American Cast Iron Pipe Co., which was on a per foot instead of a per ton basis, was also the equivalent of $40. As only a relatively small tonnage was involved, i. e., 225 tons of 8-in. class C, there seems to be no doubt that $39, Birmingham, would be freely quoted on any sizable tonnage.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., $51.20 to $52.20; 6-in. and over, $47.20 to $48.20; Class A and gas pipe, $5 extra.

Billets.—Local producers have advanced open-hearth billets to $38 per gross ton, Chicago, but no sales at that figure are reported. A local inquiry is current for 1500 tons.

Reinforcing Bars.—While demand has suffered some reaction following recent price advances, the market is by no means inactive. A sewer project at Minneapolis will require more than 2000 tons, when all sections are awarded. The steel for another section of the South Water Street Improvement, Chicago, has been placed, and considerable reinforcing will be required in connection with State highway contracts. The warehouse price on steel in carload lots is 2.50c., Chicago. For less than carload orders 2.65c., Chicago, is the ruling quotation. The extra for heavy bending has been increased from $6 to $8 a ton, and the extra for light bending from $18 to $20 a ton.

Lettings include:

Gold Furniture Co. building, Chicago, 350 tons, to Kalman Steel Co.

Central warehouse, Minneapolis, 350 tons, to Concrete Steel Co.

Section 1, South Water Street Improvement, Chicago, 100 tons, to Concrete Steel Co.

Pending work includes:

Municipal sewer work, Minneapolis, 2000 tons.

Churchill warehouse, Cedar Rapids, Iowa, 350 tons, Theodore Stark Co., Cedar Rapids, general contractor.

Old Material.—Consumer demand is increasingly general and, although some of the larger buyers still hesitate to pay current prices, most users are buying rather freely. Orders for cast, malleable and low phosphorus grades are especially numerous. Three different steel interests have bought heavy melting and allied grades during the week, one of them having closed for 10,000 tons and another for 3000 tons. Apparently

(*Concluded on page* 1379)

New York

Increased Activity in Finished Steel—Heavy Buying of Pig Iron

NEW YORK, Nov. 18.—Buying of pig iron has continued with sales for the past week amounting to about 35,000 tons, while inquiries aggregating from 12,000 to 15,000 tons are still pending. The principal sales of the week were 12,000 tons to the American Radiator Co. for its Bayonne, N. J., plant, 5500 tons to a railroad equipment company and 5000 tons to Richardson & Boynton. Some of the recent buyers apparently overstayed the market, which is showing a decidedly upward trend. At Buffalo, Susquehanna iron is now quoted at $22 for No. 2 plain for next year and $23 for this year, with $1 differentials for both deliveries, and a sale of a small tonnage of No. 1 iron for first quarter of 1925 has been made at $24, but these high prices are not established. One important company in the Buffalo district has withdrawn temporarily. In eastern Pennsylvania $22 is generally quoted and it is doubtful whether less than that could be done except on a very desirable tonnage. As prices advance in this country much greater interest is being shown in foreign grades, and it is understood that negotiations for the importing of very large tonnages are pending. A cargo of 5000 tons of pig iron is expected to arrive from Holland about Dec. 15. It is being imported by a New York firm. Owing to improvement of conditions abroad doubt is being expressed as to whether the movement from Europe will be important.

We quote delivered in the New York district as follows, having added to furnace price $2.27 freight from eastern Pennsylvania, $4.91 from Buffalo and $5.44 from Virginia:

East. Pa. No. 2, sil. 1.75 to 2.25	$24.27
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	25.27
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	24.77
Buffalo, sil. 1.75 to 2.25	$24.91 to 25.91
No. 2 Virginia, sil. 1.75 to 2.25	29.94 to 30.44

Ferroalloys.—British producers advanced their price for ferromanganese on Wednesday, Nov. 12, to $105, seaboard, duty paid. Because of the advance in sterling, this had been anticipated and even predicted. Before the advance fairly good sales had been made at $100, but thus far the new price has not been established by sales, although it is conceded that the alloy cannot be bought from either domestic or foreign sources at less than the new basis. Demand is light, as registered by sales recently, but there are inquiries, one for 1000 tons, one for 300 tons and several for smaller lots before the market. Sales of spiegeleisen to various consumers aggregate several thousand tons, but new inquiry is not large and prices are unchanged.

Cast Iron Pipe.—Current buying of water pipe is light, but makers are well booked on practically all sizes well up to the end of the year and are not yet inclined to shade prices, even with the usual small concession for winter delivery. We quote per net ton, f.o.b. New York, in carload lots, as follows: $55.60 to $56.60; 4-in. and 5-in., $60.60 to $61.60; 3-in., $70.60 to $71.60, with $5 additional for Class A and gas pipe. Makers of soil pipe report considerably increased activity in the face of higher prices. Jobbers are apparently anxious to get under cover before there are further advances and are placing orders at the makers' terms, which are in most cases for delivery at makers' convenience. While a majority of present orders will probably be delivered before Jan. 1, some tonnage may be carried over into next year. We quote discounts of both Northern and Southern makers, f.o.b. New York, as follows: 6-in., 42½ to 43¾ per cent off list; heavy, 52½ to 53¾ per cent off list.

Warehouse Business.—Activity though accelerated but little, is sustained, and the trend is upward. Price cutting is less in evidence and prices are firmer. There is still no eagerness to build up stocks. Galvanized sheets are more active and business in blue annealed sheets was the largest for many weeks. Some decline is noticed in structural steel, as also in reinforcing bars; in the latter case, competition is keen and it has been said that orders can be placed at 1.90c. In the nonferrous lines there is fair activity. Zinc, spelter and tin are quoted higher. Spring steel is quiet. Prices are quoted on page 1396.

Finished Iron and Steel.—Buying has been active and has broadened to include sheets and also wire, following the increased interest in bars, shapes and plates. Most consumers have now covered for their 1924 needs and are making some effort to get protection into next year. Contracts are sparingly entered into by the producers, chiefly to accommodate manufacturing consumers who have made definite commitments on their own part, but as has been the case for some time such contracts do not extend beyond the first quarter. Prices appear to be quite strong, although, of course, most of the bookings have been made at the prices ruling before the recent advances. Steel bars are now difficult to obtain at less than a price figuring back to 2.10c., Pittsburgh, and efforts are being made to put shapes on the same basis. A common asking price for plates is 1.90c., Pittsburgh basis, but no sales were learned of above 1.80c. The galvanized sheet market is 4.60c., with 4.75c. asked for first quarter, and indications that some mills will shortly name this as their minimum. Black sheets are priced at 3.50c., with 3.60c. for first quarter. One feature of the market is that buyers, unsuccessfully depressing the market and then entering relatively small orders, have sometimes doubled and quadrupled the amounts requested in successive days. Plain wire appears strong at 2.50c., Pittsburgh basis. Mill operations have increased and many producers expect that there will be a progressive expansion through December.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.34c.; plates, 2.14c. to 2.24c.; structural shapes, 2.24c. to 2.44c.; bar iron, 2.34c.

Coke.—Since Nov. 4 about 80 per cent of the coke under contract has been renewed for six months. Prevailing quotations on foundry coke range from $4.50 to $5, Connellsville ovens, and by-product coke is quoted $10.41, Jersey City and Newark.

Old Material.—The strength of other markets is beginning to be reflected in an upward movement of scrap prices. Advances have been made in practically all grades of from 50c. to $1 per ton. Heavy melting steel buying prices have been increased by brokers, who are paying from $17 to $17.50 per ton, delivered to eastern Pennsylvania consumers, and in one instance, that of a Claymont, Del., user, $18 is offered. While buyers are willing to contract at an advanced price, they are not inclined to meet the price ideas of the brokers, who point out that it is becoming increasingly difficult to secure tonnage at present offering prices. Brokers are offering slightly higher prices for specification pipe delivered to eastern Pennsylvania. No. 1 heavy breakable cast is firm at $16.50 per ton, delivered to Harrisburg, and $16, delivered Pottsville. Clean cast borings show an advance of 50c. per ton. Chemical borings are quoted at $18 per ton delivered to an eastern Pennsylvania consumer with a $4.28 freight rate. Borings and turnings are unchanged at $12.50 to $13 per ton delivered eastern Pennsylvania.

Buying prices per gross ton New York follow:

Heavy melting steel, yard	$12.00 to $12.50
Heavy melting steel, railroad or equivalent	13.75 to 14.25
Rails for rolling	14.50 to 15.00
Relaying rails, nominal	24.00 to 25.00
Steel car axles	18.50 to 19.00
Iron car axles	26.00 to 28.00
No. 1 railroad wrought	15.00 to 15.50
Forge fire	11.00 to 11.50
No. 1 yard wrought, long	13.50 to 14.00
Cast borings (clean)	10.50 to 11.00
Cast borings (chemical)	13.75 to 14.25
Machine shop turnings	10.50 to 11.00
Mixed borings and turnings	9.25 to 9.75
Iron and steel pipe (1 in. diam., not under 2 ft. long)	12.25 to 12.75
Stove plate	11.75 to 12.25
Locomotive grate bars	11.50 to 12.50
Malleable cast (railroad)	14.00 to 14.50
Cast iron car wheels	14.50 to 15.00
No. 1 heavy breakable cast	12.25 to 12.75

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast	$16.00 to $16.50
No. 1 heavy cast (columns, building materials, etc.), cupola size	14.00 to 14.50
No. 2 cast (radiators, cast boilers, etc.)	13.00 to 13.50

St. Louis

Heavy Buying of Pig Iron Continues with Northern and Southern in Demand

ST. LOUIS, Nov. 18.—This has been another week of heavy buying of pig iron. The St. Louis Coke & Iron Co. sold between 7000 and 7500 tons, of which 3000 tons was basic for prompt shipment to an East Side melter, and 4000 to 5000 tons, foundry grades, of which 1000 tons was for shipment the remainder of the year and the rest for first quarter. The largest single order of foundry iron was 2500 tons to a melter in the district. The Sloss-Sheffield Steel & Iron Co. sold about 5000 tons of Southern iron for first quarter shipment via water and rail from Florence and Sheffield, Ala., as a result of its final tip to the trade to make purchases before an advance, which that company has now established. The representative of another concern sold about 2000 tons in lots from a carload up to 300 tons. The principal inquiries before the market are 500 tons each from an Iowa melter and a Springfield, Ill., concern. Most of the orders are being placed without the formality of an inquiry. The heavy buying movement which has weighted down the order file of the makers has strengthened the market materially. Melters are increasing their specifications against contracts and are urging that shipments be made.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices $2.16 freight from Chicago, $3.28 from Florence and Sheffield (rail and water), $5.17 from Birmingham, all rail, and 81c. average switching charge from Granite City:

Northern fdy., sil. 1.75 to 2.25	$22.66 to $23.16
Northern malleable, sil. 1.75 to 2.25	22.66 to 23.16
Basic	22.66 to 23.16
Southern fdy., sil. 1.75 to 2.25 (rail)	22.67 to 23.67
Southern fdy., sil. 1.75 to 2.25 (rail and water)	20.78 to 21.78
Granite City iron, sil. 1.75 to 2.25	22.31 to 22.81

Alloys.—The alloys have been in more active demand within the last week, a desire of consumers to get their orders in ahead of the advance causing a buying movement. Three orders of ferromanganese—300 tons, 150 tons and 100 tons, respectively, and 300 tons of spiegeleisen—250 tons and 50 tons—were reported.

Finished Iron and Steel.—The only new railroad inquiry of the week came from the Wabash and was for its requirements of splice bars, track bolts and tie plates for first half of 1925, no quantities being specified. Orders in most other lines have been coming in steadily, and while buyers are still conservative in commitments, the volume is reported to be satisfactory.

For stock out of warehouse we quote: Soft steel bars, 3.35c. per lb.; iron bars, 3.35c.; structural shapes, 3.45c.; tank plates, 3.45c.; No. 10 blue annealed sheets, 4.10c.; No. 28 black sheets, cold-rolled one pass, 5c.; cold-rolled rounds, shafting and screw stock, 4.15c.; structural rivets, 3.90c.; boiler rivets, 4.10c.; tank rivets, ⅞-in. and smaller, 60 per cent off list; machine bolts, 55 and 5 per cent; carriage bolts, 40 and 5 per cent; lag screws, 60 and 5 per cent; hot pressed nuts, squares or hexagons, blank or tapped, $3.50 off list.

Coke.—A steady improvement in the demand for industrial coke is reported by the by-product ovens in the district, but there is very little demand for Connellsville grades. The demand for domestic coke is still affected by the weather, which has not been cold.

Old Material.—The market for old material continued steadily to advance, prices this week being from 50c. to $1.50 a ton higher than last week. While there have been no large individual purchases, the volume continues heavy, and there are a number of inquiries before the market. Added strength is given by the statement that dealers' stocks are low, and in Arkansas and Texas freight rates are too high to move that which has been accumulated. The Baltimore & Ohio is out with a list of 14,000 tons, and other lists follow: Rock Island, 5000 tons; Missouri Pacific, 3000 tons; Missouri-Kansas-Texas, 2100 tons; St. Louis & San Francisco, 1000 tons and Mississippi River & Bonne Terre, 500 tons.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton	
Iron rails	$17.00 to $17.50
Rails for rolling	18.50 to 19.00
Steel rails, less than 3 ft.	19.00 to 19.50
Relaying rails, 60 lb. and under	25.00 to 26.00
Relaying rails, 70 lb. and over	33.50 to 33.50
Cast iron car wheels	17.50 to 18.00
Heavy melting steel	16.00 to 16.50
Heavy shoveling steel	16.00 to 16.50
Frogs, switches and guards cut apart	17.00 to 17.50
Railroad springs	19.50 to 20.00
Heavy axles and tire turnings	12.50 to 13.00
No. 1 locomotive tires	17.00 to 17.50
Per Net Ton	
Steel angle bars	15.00 to 15.50
Steel car axles	19.00 to 19.50
Iron car axles	24.00 to 24.50
Wrought iron bars and transoms	19.00 to 19.50
No. 1 railroad wrought	14.00 to 14.50
No. 2 railroad wrought	14.00 to 14.50
Cast iron borings	10.75 to 11.25
No. 1 busheling	14.00 to 14.50
No. 1 railroad cast	17.00 to 17.50
No. 1 machinery cast	18.50 to 19.00
Railroad malleable	15.00 to 15.50
Machine shop turnings	7.50 to 8.00
Champion bundled sheets	9.00 to 9.50

Buffalo

Pig Iron Prices Advanced—Mill Operations Are Increased

BUFFALO, Nov. 18.—Only two interests in the Buffalo district have iron to sell for the remainder of this year; three furnace interests are out of the market. One of the producers having iron to sell for the last quarter has established a $21 base with $21.50 for 2.25 to 2.75 silicon foundry and $22.50 for 2.75 to 3.25 silicon foundry. Its first quarter price is $20, $20.50 and $21.50 for the corresponding grades of iron. The other producer is not quoting under $20 on current business. These moves place the Buffalo market in the firmest position it has been in months and makers believe the volume of inquiry coming in will enable them to sustain their price position. The total amount of inquiries for the past week was 15,000 tons, showing the easing-off which occurred with price advances. A boiler making concern from the central part of the State inquired for 3000 to 4000 tons and another inquiry was for 2500 tons. The Gould Coupler Co. asked bids on 1000 to 2000 tons of malleable. A 4000-ton inquiry mentioned last week is believed to have been placed. For the week prior to Nov. 15, one maker sold 10,000 to 11,000 tons, most of which was taken at $19.50. All makers believe the market is on the upward trend and will make a very strong effort to obtain a higher price.

We quote prices f.o.b. gross ton, Buffalo, as follows:

No. 2 plain, sil. 1.75 to 2.25	$20.00 to $21.00
No. 1 foundry, sil. 2.75 to 3.25	21.50 to 22.50
No. 2 foundry, sil. 2.25 to 2.75	20.50 to 21.50
Malleable, sil. up to 2.25	20.00 to 21.00
Basic	20.00 to 21.00
Lake Superior charcoal	29.28

Finished Iron and Steel.—Mills are very much encouraged by the increasing volume of tonnage now coming in, and believe that the upward swing of business has commenced. Bars and shapes have strengthened and are firm at 2.00c. The plate market is better than it was with 1.80c. ruling. Sheets are firmer at 3.50c. for black and 4.60c. for galvanized. One of the lots placed during the week was for 500 tons of black. The tin plate market is more active, but the new prices for first half are not yet out. Bids are in for Shea's new theater, to require 1450 tons of structural and 200 tons of reinforced steel. A local fabricator has booked 700 tons of steel for Beals, McCarthy & Rogers new warehouse. Mill activity is better; the Donner Steel Co. has lit three more open hearths and general finishing mill operation throughout the entire district is better.

Steel bars, 3.30c.; iron bars, 3.35c.; reinforcing bars, 3.30c.; structural shapes, 3.40c.; plates, 3.40c.; No. 10 blue sheets, 4.05c.; No. 28 black sheets, 4.75c.; No. 28 galvanized sheets, 5.35c.; bands, 4.05c.; hoops, 4.40c.; cold-finished rounds, 4.20c.; cold-finished shapes, 4.70c.

Old Material.—The market has strengthened and almost all the commodities on the list are higher in price this week. Nearly all the mills are purchasing and dealers are buying briskly, in some cases paying more than the mills. The dealers believe the market is on the upward swing and are endeavoring to cover accordingly. The more conservative dealers believe the prices will rise but not till after the first of the year to any appreciable extent. The market outside is very active, but it will have to reach $21 in the Valley to offset the $18 price which is prevailing for heavy melting steel now. While buying by the mills is better, they are not yet buying in the volume they do when order books are swelling. Local mills claim to be covered until Jan. 1. Along with heavy melting steel, No. busheling, turnings and borings and low phosphorus scrap have strengthened perceptibly and in fact all of the grades are strong with the exception of cast scrap.

We quote f.o.b. gross ton, Buffalo, as follows:

Heavy melting steel	$17.50 to $18.50
Low phosphorus, 0.04 and under	20.00 to 20.50
No. 1 railroad wrought	15.50 to 16.50
Car wheels	16.50 to 17.50
Machine shop turnings	12.50 to 13.00
Cast iron borings	12.50 to 13.50
No. 1 busheling	16.00 to 16.50
Stove plate	15.00 to 15.50
Grate bars	14.50 to 15.00
Bundled sheets	12.50 to 13.00
Hydraulic compressed	16.50 to 17.00
Railroad malleable	17.50 to 18.00
No. 1 machinery cast	17.00 to 17.50

Boston

Pig Iron More Active and Furnaces Less Inclined to Shade Prices—Foreign Iron Coming

BOSTON, Nov. 18.—The past week witnessed the continued buying of small tonnages of pig iron, largely Buffalo and Alabama, with less inclination on the part of furnaces to disregard silicon differentials. One company has advanced prices $2 to $3 a ton, making No. 2 plain for 1924 business $23 with $1 differentials. For first quarter shipment this company is on a $22 basis with $1 differentials. These, of course, are not prevailing prices, but Buffalo iron now appears fairly firmly established on a $20 furnace base, and eastern Pennsylvania $21 to $21.50. One Alabama furnace is so well sold up it is discriminating in accepting orders. The present week will be more active than the past if foundries asking for tenders cover. Inquiries aggregate about 8000 tons and include 1000 tons No. 2X, first quarter, for a Vermont melter; 2000 tons, two-thirds No. 2X and the remainder No. 1X, first quarter, for a Rhode Island concern; 1000 tons No. 2 plain and No. 2X for a Massachusetts machinery maker; 600 tons of three grades, first quarter, and 450 for second quarter shipment for a New Hampshire foundry; as well as a list of smaller tonnages. Foundries are buying iron in anticipation of business, not because of current needs. An eastern Pennsylvania furnace, out of the market for a month or so, is about to reopen its books. Foreign iron is steadily becoming a real factor in this market. Recent sales of India iron include two 1000-ton lots, silicon 2.50 to 3.00. One local pig iron house, in past years a large handler of foreign iron, is negotiating for additional importations of Continental iron before the close of 1924. Report has it a large tnnage of Dutch iron is to be brought into Providence, R. I. Sales are reported to have been made against its arrival, silicon 2.50 to 3.00, at $22.50 on dock, duty paid.

We quote delivered prices on the basis of the latest reported sales as follows, having added $3.65 freight from eastern Pennsylvania, $4.91 from Buffalo, $5.92 from Virginia and $9.60 from Alabama:

East. Penn., sil. 1.75 to 2.25	$24.65 to $25.15
East. Penn., sil. 2.25 to 2.75	25.15 to 25.65
Buffalo, sil. 1.75 to 2.25	24.91
Buffalo, sil. 2.25 to 2.75	25.41
Virginia, sil. 1.75 to 2.25	29.42 to 29.92
Virginia, sil. 2.25 to 2.75	29.92 to 30.42
Alabama, sil. 1.75 to 2.25	27.10 to 27.60
Alabama, sil. 2.25 to 2.75	27.60 to 28.10

Finished Material.—Practically all of the plate mills have advanced prices $3 a ton to $2.11½ per 100 lb. delivered, freight allowed, equivalent to 1.75c. on cars Pittsburgh. Some of the mills took a moderate tonnage at $1.96 delivered before advancing their prices, but the rank and file of consumers continue to buy on a hand-to-mouth basis. One of the largest producers of shapes will advance prices $2 a ton this week to $2.46½ per 100 lb. delivered, freight allowed, equivalent to 2.10c. on cars Pittsburgh. The market for bars is still $2.26½ delivered. Some mills have advanced cold-rolled steel $2 a ton. No large shape tonnages were closed here the past week, business being confined to numerous small orders.

Warehouse Business.—Although not active, the movement of iron and steel out of warehouses is on the increase. Warehouse stocks are fairly well assorted, but not heavy on the average line of material. Talk of higher prices by mill representatives has had a tendency to make for firmness on warehouse quotations, without any actual change upward. Copper and brass products have been advanced 1c. per lb. Manufacturers of copper rivets have advanced prices slightly, but no change is made in resale prices. Manufacturers have adopted national standard stove bolts and large head standard. The latter have the same dimensions as the old head bolts, but cost considerably more. Sheet lead is ¾c. a lb. higher at 16¼c. per lb. list.

Coke.—With practically all of the New England foundries covered on first half of 1925 by-product foundry coke requirements, on a basis of price ruling on date of shipment, the outstanding feature of the market is the increased specification against last half of 1924 contracts. Current business is largely for winter stocking purposes. The ratio of operation to aggregate plant capacity has not increased sufficiently since Nov. 1 to warrant larger coke purchases. Both the New England Coal & Coke Co. and the Providence Gas Co. continue to quote foundry coke at $11.50 a ton delivered in New England. If present plants carry, a by-product foundry and domestic coke plant will be constructed in Hartford, Conn., in 1925. By-product New York State ovens will be completed next year. New England bids fair to become the battlefield for bitter competition for foundry coke business.

Old Material.—A jacking up of prices by dealers has resulted in a somewhat freer movement of old material in this territory. Many owners, however, are still holding material for higher prices. More heavy melting steel changed hands the past week than for some time, yet the market is not really active. For ordinary material, prices are 50c. a ton higher, and on railroad steel $1. Brokers are offering $1 more for pipe than a week ago, and rolling mill borings have appreciated that much. Machine shop turnings are easily worth 50c. a ton more. In contrast, chemical borings remain unchanged, and there being no market for mixed borings and turnings, prices have had no opportunity to go up. Bundled skeleton is higher, while forged scrap is difficult to move at any price. Shafting and street car axles have advanced 50c. a ton, and rails for rerolling $1 in sympathy with the general trend of values. If anything, these materials are less active than before. With New England foundries chiefly occupied with pig iron and coke, little interest is shown by them in machinery cast or stove plate.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast	$18.00 to $19.00
No. 2 machinery cast	15.00 to 16.00
Stove plates	14.00 to 14.50
Railroad malleable	17.50 to 18.00

The following prices are offered per gross ton lots, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$13.50 to $14.00
No. 1 railroad wrought	13.50 to 14.00
No. 1 yard wrought	12.50 to 13.00
Wrought pipe (1-in. in diam., over 2 ft. long)	12.00 to 12.50
Machine shop turnings	9.50 to 10.00
Cast iron borings, chemical	12.00 to 12.50
Cast iron borings, rolling mill	9.50 to 10.00
Blast furnace borings and turnings	8.50 to 9.00
Forged scrap	8.00 to 8.50
Bundled skeleton	9.50 to 10.00
Bundled cotton ties	8.50 to 9.00
Forged flashings	10.00 to 10.50
Shafting	18.00 to 18.50
Street car axles	18.00 to 18.50
Rails for rerolling	14.00 to 14.50
Scrap rails	13.00 to 13.50

Cincinnati

About 40,000 Tons of Pig Iron Sold—Price Trend Is Upward

CINCINNATI, Nov. 18.—The buying movement in pig iron continues unabated, and last week close to 40,000 tons was placed by melters in this district, all grades being in clued. The largest sale was of 13,000 tons of Northern grades. Several orders for 3000 tons were reported, and a number ranging from 1000 tons to 1500 tons, both Northern and Southern, were placed. About 20,000 tons are on inquiry. The market is strong, one furnace in southern Ohio having advanced to $22, Ironton, for all deliveries, while another, shortly to go into blast, is quoting $21 for first quarter. In the Alabama district, the lowest price now quoted for first quarter is $18, with sales having been made as high as $19. Silvery furnaces, having acquired a backlog, are now quoting the regular schedule of $30.50 for first quarter for 8 per cent, but for prompt shipment $29.50 can be done. Southern Ohio basic is nominally quoted at $20.50 and Bessemer at $22. Several sales of charcoal iron at $26 furnace were made, one involving 1000 tons. Belfont furnace at Ironton is expected to go into blast early in December.

Based on freight rates of $4.05 from Birmingham and $2.27 from Ironton we quote f.o.b. Cincinnati:

Southern fdy., sil. 1.75 to 2.25 (base)	$22.05 to $23.05
Southern fdy., sil. 2.25 to 2.75	22.55 to 23.55
Southern Ohio silvery, 8 per cent	31.77 to 32.77
Southern Ohio fdy., sil. 1.75 to 2.25	23.27 to 24.27
Southern Ohio, basic	22.77
Southern Ohio malleable	23.27 to 24.27

Sheets.—While some orders have been booked by mills that named prices for first quarter, the trade generally is waiting for word from the American Sheet & Tin Plate Co., and it is expected that books of the company will be opened this week. Reports generally agree that advances of from $2 to $4 per ton will be named, the higher figure the more probable one. Meantime there has been a large amount of business placed for delivery during November and December at prices now in effect. In Indiana territory, prices of 4.60c., Gary basis, have been quoted by Ohio mills, and for first quarter it is reported that the equivalent of 4.70c., Gary, can be done on galvanized sheets. Inquiry for tin plate for first half is fairly heavy, but nothing has been done as yet by mills toward naming prices for this delivery. Automobile body sheets for delivery during the rest of the year have been advanced $2 per ton to 4.75c., Pittsburgh.

Tool Steel.—Orders, while more numerous, continue for small lots. Prices are well maintained, the range on 18 per cent tungsten high speed steel being from 70c. to 95c. per lb.

Reinforcing Bars.—Most of the activity is for carload lots for immediate shipment, though a number of projects will be up for bids this week which involve substantial tonnages. Prices are stiffening, and the lowest price to be had for rail steel bars today is 1.95c., mill, with new steel bars quoted pretty generally at 2c., Pittsburgh.

Structural Activity.—The market is quiet, the only letting of importance being an award of 1200 tons by the Louisville & Nashville Railroad. There were no inquiries of consequence.

Warehouse Business.—Demand continues good for immediate shipment, with prices steady and unchanged. Reports of an increase of $2 per ton in prices of wire nails and other wire products are heard, but nothing has been done by jobbers.

Cincinnati jobbers quote: Iron and steel bars, 3.30c.; reinforcing bars, 3.30c.; hoops, 4.35c.; bands, 3.95c.; shapes, 3.40c.; plates, 3.40c.; cold-rolled rounds, 4.05c.; cold-rolled flats, squares and hexagons, 4.55c.; open-hearth spring steel, 4.75c. to 5.75c.; No. 10 blue annealed sheets, 3.90c.; No. 28 black sheets, 4.60c.; No. 28 galvanized sheets, 5.75c.; No. 9 annealed wire, $3.15 per 100 lb.; common wire nails, $3.15 per keg base; cement coated nails, $2.85 per keg.

Finished Materials.—Bookings of bars, shapes and plates increased considerably during the past week as compared with similar periods before the election, but most of the tonnages were for shipment before the first of the year. Prices are firmer, and bars and shapes are now steady at 2c., Pittsburgh, with plates at 1.90c., Pittsburgh, though reports are current that plates had been bought during the week at 1.85c., Pittsburgh. More strength is apparent in the nail market, and an advance of $2 per ton is expected. Demand is improving. On wire fence and other wire products little activity is being displayed. There is no activity in track materials or light rails, carload orders predominating. Reports of concessions are heard in bolt prices, but business generally is confined to fill-in orders, and the larger manufacturers at least are holding prices steady. A slight improvement is reported in the demand for cold-finished materials, with prices firm. Orders are being placed for hoops and bands with more freedom, and the extremely low prices current some weeks ago have about disappeared. Inquiry for first quarter materials is fairly heavy, but mills are hesitant about booking this business at current prices, and so far have not named any prices for delivery after the end of the year.

Coke.—There was a fair amount of activity in foundry coke and domestic also was more active. Prices are steady and unchanged.

Old Material.—Dealers are taking on tonnages of old materials, but consumers are not participating actively in the market. There is a better movement to mills on contracts, however. Prices are fairly steady and unchanged from last week.

We quote dealers' buying prices, f.o.b. cars, Cincinnati:

Per Gross Ton	
Heavy melting steel	$14.50 to $15.00
Scrap rails for melting	13.50 to 14.00
Short rails	17.00 to 17.50
Relaying rails	29.00 to 29.50
Rails for rolling	15.00 to 15.50
Old car wheels	13.50 to 14.00
No. 1 locomotive tires	16.00 to 16.50
Railroad malleable	15.50 to 16.00
Agricultural malleable	14.00 to 14.50
Loose sheet clippings	11.00 to 11.50
Champion bundled sheets	12.00 to 12.50
Per Net Ton	
Cast iron borings	10.00 to 11.00
Machine shop turnings	9.50 to 10.00
No. 1 machinery cast	18.00 to 18.50
No. 1 railroad cast	15.50 to 16.00
Iron axles	21.00 to 21.50
No. 1 railroad wrought	11.50 to 12.00
Pipes and flues	8.00 to 8.50
No. 1 busheling	10.50 to 11.00
Mixed busheling	8.50 to 9.00
Burnt cast	10.50 to 11.00
Stove plate	10.50 to 11.00
Brake shoes	12.00 to 12.50

Birmingham

Probable Production for First Quarter Sold by Alabama Furnaces

BIRMINGHAM, ALA., Nov. 18.—Selling of pig iron by southern furnace interests during the past ten days aggregates not far from the probable make of the first three months of 1925. Consumers in the home territory have come into the market also, inquiries have been steady and further business is assured. Local consumption is being increased. Quotations continue at $18 for No. 2 foundry, delivery this year, and $18.50 for first quarter next year. Smaller furnaces are asking $19 and this may be the quotation before another fortnight. Numerous immediate delivery orders are still coming in and in some instances these orders are being filled the day they are received. The surplus stock of pig iron will probably be required in meeting the demand. J. W. McQueen, president Sloss-Sheffield Steel & Iron Co., expresses confidence on the turn of the market and says that the present strength will continue indefinitely. His bookings aggregate well into the first quarter of 1925. The orders recently have ranged from 100 tons to 10,000 tons. The Woodward Iron Co. has been producing basic iron at one of its Woodward furnaces, recently filling an order for con-

siderable tonnage of that grade. The Tennessee Coal, Iron & Railroad Co. has started a Bessemer furnace.

We quote per gross ton, f.o.b. Birmingham district furnace, as follows:

No. 2 foundry, 1.75 to 2.25 sil.	$17.50 to $18.50
No. 1 foundry, 2.25 to 2.75 sil.	18.00 to 18.50
Basic	18.50 to 19.00
Charcoal, warm blast	30.00 to 31.00

Steel.—Improved conditions are also noted in the Southern steel market. Productions and fabrication both are steadier, fabrication plants apparently receiving numerous orders for small tonnages in structural steel. Steel prices are firmer and changes upward intimated for the near future. Soft steel bars are quoted 2.05c. to 2.15c., Birmingham.

Cast Iron Pipe.—Demand for cast pipe is active in both the gas and water pipe and the sanitary pipe. At $42 to $43 for 6-in. pipe and over, there is a little improved demand. All plants on the larger sized pipe have been producing steadily and have been shipping steadily. Sanitary pipe is enjoying a little spurt, and several of the shops in Birmingham, Gadsden and Anniston are operating on a six days a week schedule.

Old Material.—The scrap market continues dull. Quotations remain stationary on the low level reached some time since.

We quote per gross ton f.o.b. Birmingham district yards as follows:

Cast iron borings, chemical	$15.00 to $16.00
Heavy melting steel	12.00 to 12.50
Railroad wrought	12.00 to 13.00
Steel axles	17.00 to 18.00
Iron axles	19.00 to 19.50
Steel rails	12.50 to 13.00
No. 1 cast	14.00 to 15.00
Tram car wheels	15.00 to 16.00
Car wheels	14.00 to 15.00
Stove plate	13.50 to 14.00
Machine shop turnings	6.00 to 7.00
Cast iron borings	7.00 to 8.00
Rails for rolling	15.00 to 16.00

San Francisco

Confidence Improves as Demands Increase and Prices Show Firmer Tendencies

SAN FRANCISCO, Nov. 14 (*By Air Mail*).—More confidence on the part of buyers and a stronger general tone in the Pacific Coast iron and steel market have been apparent since election day. The confidence of buyers has been shown by the larger number of inquiries for iron and steel of all kinds, as well as by the improved volume of orders that have been placed during the past ten days. The general improvement in buying tendencies has also been reflected in firmer prices, and in some instances, by price advances, notably in plates, sheets and structural shapes, which were all advanced about $2 a ton by several of the independent mills.

Although buying, strictly speaking, is not heavy, the amount of business that is being done now, as compared with the period before election, is better balanced. Orders for stock, however, are for the most part small, and confined to immediate requirements. There is not likely to be any large buying of this type until after inventories have been taken and business has entered upon a new year. It is, perhaps, noteworthy that both buyers and sellers in this section expect a larger volume of business during the first part of next year.

Pig Iron.—Most of the current inquiries are for small lots, although interest is reported to be somewhat better than it was a fortnight ago. Actual orders placed have been small. Local stocks are apparently adequate for present needs, although there is no large accumulation. Prices are firm, with domestic basic being quoted at $27 to $27.50 per ton and domestic foundry at $27.50 to $30 per ton. Imported Scotch and English iron ranges from $26.50 to $29 per ton, and Belgian iron is being quoted from $25.50 to $27 per ton. Inquiries for small lots of imported iron during the past two weeks are reported to average around 3000 tons.

Coke.—Interest is limited, with prices holding firm at $16.50 to $17.50 per ton. Importations have been comparatively light, although some importers report shipments en route. Local stocks are moderate.

Plates.—Some of the independent mills have advanced prices $2 per ton, although 2.25c. base, c.i.f. is still being quoted in this market. Orders are larger, and the number of inquiries that have been received indicate that buyers are becoming more active. A contract for 150 tons of plates has been placed by the Southern Pacific Railroad with one of the Eastern independent mills, and a number of contracts involving several thousand tons are pending. Current quotations range from 2.25c. to 2.35c. base, c.i.f.

Structural Material.—Activity features the market for structural material, which has been reflected in a price advance of $2 made by some of the independent mills. Current quotations are 2.35c. to 2.45c. base, minimum, c.i.f. The Judson Mfg. Co., San Francisco, has been awarded a contract for 300 tons for the San Jose Telephone Co. building, and the Western Iron Works has taken 212 tons for Hills Brothers warehouse, San Francisco. Among contracts pending are the following: Subway Terminal Building, Los Angeles, 4000 tons; Merced Irrigation District, 5 bridges for Yosemite Valley Railroad, 3603 tons; Spreckles Building, San Diego, 3000 tons; Beacon Hill Bridge, Seattle, 522 tons.

Bars.—Heavy tonnages are reported to be pending for concrete reinforcing bars, which are quoted at 3.80c., less than carload out of stock, and 3.35c. carload. Merchant bars are 2.45c. out of stock in mill lots of 100 tons. Contracts pending average around 3000 tons.

Sheets.—An advance of $2 per ton was made by some of the independent mills during the past week. Orders are larger and inquiries are more numerous than they have been for several weeks. Blue annealed is quoted at 2.70c., Pittsburgh; black, 3.75c. to 3.85c., Pittsburgh, and galvanized ranges from 4.60c. to 4.75c., Pittsburgh.

Old Material.—The market for scrap is firm, the supply is apparently ample and the demand is light. Local mills seem to be fairly well supplied and orders are consequently confined. The price here for heavy melting steel is $11 per ton. The Los Angeles price is holding at $10 per ton on a sluggish market.

Prices for scrap delivered to consumer's mill are as follows per gross ton:

No. 1 heavy melting steel	$11.00 to $12.00
Scrap rails, miscellaneous	11.00 to 12.00
Rolled steel wheels	11.00 to 12.00
Couplers and knuckles	11.00 to 12.00
Mixed borings and turnings	6.00 to 6.50
Country mixed cast scrap	8.50 to 9.00

Detroit Melters Covered for First Quarter—Scrap Market Rather Soft

DETROIT, Nov. 18.—Practically all melters in the district have covered for their first quarter requirements on pig iron and while there has been no speculation in the buying, the tonnage shows the melters expect to operate during the first quarter on a basis comparable with the same period last year, buying was general and covered all lines of business.

There has been no change in prices in the scrap market and there is a softer tendency than a week ago, evidently influenced by the fact that shortly after election the mills covered for their requirements for the remainder of the year and are not expecting further heavy purchases until after inventory is finished.

The following prices are quoted on a gross ton basis f.o.b. producers' yards, excepting stove plate, No. 1 machinery cast and automobile cast, which are quoted on a net ton basis:

Heavy melting steel	$15.00 to $16.00
Shoveling steel	15.00 to 16.00
Borings	12.00 to 13.00
Short turnings	12.00 to 13.00
Long turnings	11.50 to 12.50
No. 1 machinery cast	16.00 to 17.00
Automobile cast	17.50 to 18.50
Hydraulic compressed	12.75 to 13.50
Stove plate	14.00 to 15.00
No. 1 busheling	13.00 to 14.00
Sheet clippings	10.00 to 10.75
Flashings	10.50 to 12.00

Cleveland

Heavy Buying of Finished Material Followed by Price Advances

CLEVELAND, Nov. 18.—A heavy buying movement in steel, principally in steel bars, set in the latter part of last week and was followed Monday by a general price advance of $2 a ton or to 2.10c., Pittsburgh, on steel bars and structural material and to 1.90c. on plates. Local mills have joined in the advance. Most of the tonnage placed was at the recently prevailing price, but a limited amount of business has been booked at the new prices. Sales include several lots of 1000 tons and a few larger lots. While it is too early to determine whether new prices will hold on plates, the entire market has a strong tone and the mills seem disposed to adhere to prices that will result in a better financial showing in the coming year. Several mills are taking contracts for the entire first quarter and others only for delivery extending partly through that quarter. Sales have been well distributed among various manufacturing industries, and the buying movement appears to have been brought on by reports that were generally circulated among consumers that a price advance was imminent. The sheet market is firmer, although price advances are not general. Cold-rolled strip steel has been advanced $3 a ton, and prices on hot-rolled strip have been announced for the first quarter. The Wilson Transit Co. has placed a Lake boat requiring 5000 tons of steel with the Great Lakes Engineering Works, Detroit, and another Lake boat is still pending. In the structural field considerable work is pending, and fabricators are stiffening on prices. Bids for 8000 tons of steel for the Ohio Bell Telephone building, Cleveland, were rejected, and new bids will be asked for a little later. An inquiry is pending for 400 tons of plates and shapes for car repair work for the Nickel Plate Railroad. An Ohio locomotive builder is figuring on several inquiries aggregating 30 locomotives.

The pig iron market continues very active with price advances of from 50c. to $2 a ton.

Jobbers quote steel bars, 3.10c.; plates and structural shapes, 3.20c.; No. 28 black sheets, 4.35c.; No. 28 galvanized sheets, 5.45c.; No. 10 blue annealed sheets, 3.45c. to 3.60c.; cold-rolled rounds, 3.90c.; flats, squares and hexagons, 4.40c.; hoops and bands, 1 in. and wider and 20 gage and heavier, 3.85c.; narrower than 1 in., all gages, 4.35c.; No. 9 annealed wire, $3.05 per 100 lb.; No. 9 galvanized wire, $3.50 per 100 lb.; common wire nails, $3.25 base per 100 lb.

Pig Iron.—The heavy buying movement of foundry and malleable iron that was in full swing a week ago has continued through the past week and while it does not yet show signs of subsiding, some tapering off is expected this week. Cleveland interests sold 165,000 tons of pig iron in the past week or about the same as during the previous week. Most northern Ohio consumers are now under cover for the first quarter, but considerable iron is still to be purchased for that delivery in some of the outlying districts. Cleveland furnaces have withdrawn from the market, being virtually sold up for the first quarter, and a local interest has also discontinued sales from the western Pennsylvania furnace for the same reason. Buying has been well distributed among various industries. Automobile foundries have not bought so heavily as a year ago, but larger tonnages have been purchased by agricultural implement, stove and some radiator manufacturers. Pending inquiry aggregates 50,000 tons or more. Considerable inquiry is coming from New England. Prices on foundry and malleable iron have advanced fully 50c. a ton over a week ago, but some producers are $1 a ton higher. For Cleveland delivery the market is established at $21 at furnace and one producer reports the sale of several lots aggregating 7000 tons at a price for outside shipment or an advance of $1. Other sales were made for shipment from Cleveland at $20, although $20.50 is probably the minimum local price today. The market in Michigan and in a large part of Indiana is $20.50. In the Valley district, one furnace has marked its price up to $22, at which some sales are reported, but Valley foundry iron is still available at $20.50. The inquiry of the Westinghouse Electric & Mfg. Co. for an unspecified amount of iron for its Cleveland and Trafford City plants for the first half is still pending. The National Transit Co., Oil City, Pa., is inquiring for 1000 tons of foundry iron and many 500-ton lots are pending. One recent buyer for the first quarter is now inquiring for 4000 tons for the second quarter. Some of the Alabama furnaces have advanced prices 50c. for Southern iron, which ranges from $17.50 for Tennessee iron to $18.50 for Alabama iron. The Southern iron market has become active, with sales of about 4000 tons in this territory during the week. Two roll makers in the Pittsburgh district purchased 1900 tons of Southern charcoal iron for the first half at $33. No activity is reported in basic iron, on which $19.50 is now regarded as the minimum price. The inquiry from the Andrews Steel Co. for 20,000 tons of basic is still pending.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a $3.02 freight rate from Jackson and $6 rate from Birmingham:

Basic, Valley furnace	$19.00 to $19.50
N'th'n No. 2 fdy., sil. 1.75 to 2.25	21.50
Southern fdy., sil. 1.75 to 2.25	23.51 to 24.51
Malleable	21.50
Ohio silvery, 8 per cent	32.52
Stand. low phos., Valley furnace	28.00 to 28.75

Iron Ore.—Lake shipments are being rapidly cleaned up and most of the ore firms will ship their last cargoes this week, although a few boats will continue in the ore trade until the end of the month.

Bolts, Nuts and Rivets.—Specifications for bolts and nuts on fourth quarter contracts are coming out in very good volume and some of the manufacturers are increasing plant operations. Regular discounts are being firmly maintained. Rivets are still moving rather slowly, although orders have picked up a little. The market is firm at 2.60c. Cleveland for large rivets.

Steel Bars, Plates and Structural Material.—With the price advances mills generally are holding to 2.10c., Pittsburgh, for steel bars and structural material, and 1.90c. for plates. These prices are being quoted for delivery through the first quarter.

Semi-Finished Steel.—Some inquiry is coming out for sheet bars for the first quarter, but mills have not yet named prices. There is talk of an advance, but buyers feel that the spread between semi-finished and finished steel has been too narrow and that they should get better prices for their product without a corresponding advance in raw material. Quotations for early delivery are unchanged at $37.50, Cleveland, for sheet bars and $37 for slabs.

Sheets.—Several mills that have advanced prices $2 to $3 a ton have opened their books for the first quarter at the advance, but others are holding to the old prices of 3.50c. for black, 4.60c. for galvanized and 2.60c. for blue annealed and are not selling for the first quarter. Some first quarter business has been taken at the higher prices, and some tonnage in the automobile body sheets was booked at 4.60c. for the first quarter before the $3 a ton advance.

Hot and Cold Strip Steel.—The American Steel & Wire Co. has advanced cold-rolled strip steel to 4.15c., Cleveland, and a similar $3 a ton advance has been made by independent mills that are quoting the new price for the first quarter. Some of the mills have announced hot-rolled strip steel prices for the first quarter at 2.25c. for wide strip and 2.40c. for narrow. Bands are unchanged at 2.40c. and hoops at 2.50c.

Reinforcing Bars.—Rail steel bars have not been affected by the advance in new billet steel bars and are still quoted at 1.80c. to 1.90c., Pittsburgh.

Warehouse Business.—Local warehouse prices are unchanged, and no advance is expected unless there is an advance in mill prices. However, there is less evidence of price shading than recently.

Coke.—The market has become slightly more active, with prices unchanged. Standard Connellsville foundry coke is quoted at $4 to $5.50 and by-product foundry coke at $6.50.

Old Material.—The market has become somewhat more active and all grades of scrap advanced sharply during the week. Heavy melting steel is up $1.50 per ton and most other grades are $1 or more a ton higher.

A Cleveland consumer bought a small tonnage of heavy melting steel at $18.50 delivered and sales of machine shop turnings at $15.50 and mixed borings and turnings at $16 delivered local mill are reported. Valley dealers are paying $19.50 for heavy melting steel. Dealers are not trying to force sales and are holding yard stocks for further advances. Some of the Detroit automobile companies are understood to have sold only part of their production this month, evidently holding the remainder with the expectation of getting better prices.

We quote dealers' prices f.o.b. Cleveland per gross ton:

Heavy melting steel	$17.75 to $18.00
Rails for rolling	18.00 to 18.25
Rails under 3 ft	19.25 to 19.50
Low phosphorus melting	20.50 to 20.75
Cast iron borings	15.25 to 15.50
Machine shop turnings	14.75 to 15.25
Mixed borings and short turnings	15.25 to 15.50
Compressed sheet steel	15.25 to 15.50
Railroad wrought	15.25 to 15.50
Railroad malleable	19.00 to 19.25
Light bundled sheet stampings	13.50 to 13.75
Steel axle turnings	15.25 to 15.75
No. 1 cast	19.25 to 19.50
No. 1 busheling	14.75 to 15.00
Drop forge flashings	12.75 to 13.50
Railroad grate bars	15.50 to 16.00
Stove plate	15.50 to 16.00
Pipes and flues	13.25 to 13.50

Prices Marked Up at Youngstown

YOUNGSTOWN, Nov. 18.—In rolled steel products, prices generally advanced $2 to $3 per ton the past week in this district. Products affected embrace sheets, strips, merchant bars and plates, principally, with all independent interests joining in the advance.

Even at the advanced quotations, makers are not accepting forward commitments in any extensive way, feeling that still further adjustments will come and they do not wish to be placed in the position of having a large volume of unfilled tonnage on their books in an advancing market.

Weak prices have been substantially strengthened in all directions. Typical of the prevailing sentiment is the statement of President Campbell of the Youngstown Sheet & Tube Co.—"Business is even better than I thought and predicted."

The Sheet and Tube company and the Republic Iron & Steel Co. have marked up quotations on merchant steel bars to 2.10c. per lb., and on plates to 1.90c. per lb. The market on bars recently stiffened at 2c., though preferential treatment accorded some of the more important buyers carried with it a 1.90c. price.

Coke Production Largest Since May

WASHINGTON, Nov. 18.—Reaching a total of 3,530,000 tons, production of all coke in October was the largest in any month since last May, when depression suddenly affected the steel industry, according to the Geological Survey. In comparison with the monthly average of 4,748,000 tons during the record year 1923, however, the present rate of output still shows a decrease of 25.5 per cent. Production of by-product coke in October amounted to 2,899,000 net tons, against 2,543,000 in September. The daily rate of production during October was 93,525 tons, an increase of 10.3 per cent over the September rate. By-product plants operated at 74.1 per cent of capacity. Out of 75 plants now in existence in the country, 68 were active and seven idle. The output of beehive coke also increased. The total for October is placed at 631,000 tons, or 21 per cent greater than the September production. That increased activity in iron and steel manufacture is the principal factor in the rising output of by-product coke is seen from the fact that the production of plants affiliated with blast furnaces has increased from 79.5 per cent of a total in August to 82.9 per cent in October.

F. B. Richards, vice-president M. A. Hanna Co., Cleveland, gave a talk on "The Prospects in Mining Engineering" on Nov. 18, before a joint meeting of the Ohio section of the American Institute of Mining and Metallurgical Engineers and the Pick and Shovel Club of Case School of Applied Science, Cleveland.

Philadelphia

Upward Movement Continues on Plates—Pig Iron Firm at $22 Base

PHILADELPHIA, Nov. 18.—A continuation of the upward movement of the market and evidence of growing stability of prices have featured the developments of the past week. Buyers of finished iron and steel, as well as pig iron consumers, have shown an increased desire to cover future requirements in expectation of higher prices. The recent effort of plate producers to bring prices to a level more consistent with bar and shape prices has apparently been successful and bars and shapes are also exhibiting greater strength.

The pig iron market is firm at $22 per ton, base, with some furnaces asking $22.50, but transactions thus far have been confined to the lower price. One eastern Pennsylvania furnace has temporarily withdrawn from the market with a fair tonnage booked for the rest of this year.

Following a period of dullness that continued after other iron and steel markets had begun to move upward, the scrap market developed considerable strength in the past week, as brokers paid higher prices to cover on old contracts. Buying by consumers of scrap has been light.

Pig Iron.—Inquiry is active and prices show a distinct tendency to advance. Not only has the $21.50, base, completely disappeared, but $22, base, now being quoted by most furnaces, has given way in certain instances to $22.50. This latter quotation is admittedly an asking price of sellers not seeking tonnage at present and current transactions are largely on the $22 base. However, one seller quoting the lower price claims to be offering only a limited tonnage at this figure in expectation of an advance. Inquiries range from a few hundred tons up to several thousand. While most furnaces still adhere to the 50c. differential for silicon, one large interest is stated to be asking $1, and there seems to be a general inclination to go to a similar basis. Basic is quiet and although comparatively recent sales were made at $20.50, base, the market today is placed at closer to $21 to $21.50, but with insufficient purchases to actually establish it at the higher level. Low phosphorus is stronger by about 50c. per ton. Virginia iron continues quiet and quotations are largely nominal.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76c. to $1.63 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$22.76 to $23.63
East. Pa. No. 2X, 2.25 to 2.75 sil.	23.26 to 24.13
East. Pa. No. 1X	23.76 to 24.63
Virginia No. 2 plain, 1.75 to 2.25 sil.	28.17 to 28.67
Virginia No. 2X, 2.25 to 2.75 sil.	28.67 to 29.17
Basic delivered eastern Pa.	21.00 to 22.00
Gray forge	21.50 to 22.00
Malleable	22.00 to 22.50
Standard low phos. (f.o.b. furnace)	24.00 to 24.50
Copper bearing low phos. (f.o.b. furnace)	24.00 to 24.50

Ferroalloys.—Ferromanganese has been advanced $5 per ton, to $105, seaboard, for British, or $105, furnace, for the domestic product, but no sales are reported. Inquiries are principally for small lots.

Plates.—The recent minimum of 1.75c. per lb., Pittsburgh, was still obtainable today from at least one maker, giving protection until Nov. 18. A fair range of the current market is 1.80c. to 1.90c. per lb., Pittsburgh, the minimum quotation being for particularly acceptable lots and the usual going price 1.85c. per lb. for miscellaneous specifications and the general run of business. Makers still show no particular inclination to quote for first quarter at current prices, but in at least one instance 1.85c. per lb., Pittsburgh, was quoted and accepted for January delivery. Makers look for further advances before the first quarter business reaches usual proportions.

Structural Material.—Fabricators are operating about 60 per cent of capacity, or better, and in view of

the numerous projects pending or known to be under consideration and the upward tendency of the market, there is a fair degree of purchasing against future requirements. A local shipyard came into the market last week for about 850 tons of plates, shapes and bars for two small vessels, with the privilege of doubling the tonnage. Shapes are firm at 1.95c. per lb., Pittsburgh.

Bars.—While a satisfactory tonnage might bring out a slight concession, it is generally doubted that 2c., Pittsburgh, could be shaded on any average inquiry. Inquiries are numerous, fabricators and other consumers seeking to cover requirements at present quotations. A tendency to carry larger stocks than has been the rule for many months is reported by some sellers.

Billets.—Quotations are unchanged, but the market is considerably firmer in sympathy with finished materials and the higher pig iron and scrap markets. Rerolling billets are firm at $36, Pittsburgh, with forging billets at $41. Sufficiently large inquiries to test the market are lacking.

Bolts and Nuts.—The market is firmer than for some time, and although prices are unchanged, an advance of as much as 10 per cent is predicted in some quarters.

Warehouse Business.—Inereased activity is reported and prices show more firmness than for some time, largely a reflection of the upward tendency of mill quotations. Thus far there has been no change in the schedule, although cold-rolled shafting is firm at 4.05c. for rounds and 4.55c. for flats, squares and hexagons.

Old Material.—To fulfill contracts brokers have been forced to come into the market at higher prices in many cases than they are receiving from the mills. This has resulted in keen competition for tonnage with dealers and producers of scrap inclined to hold out for higher prices. No. 1 heavy melting steel could hardly be purchased at less than $18 today and $19 is reported to have been paid in one instance by an eastern Pennsylvania consumer closing on about 10,000 tons. Another large eastern Pennsylvania consumer of scrap is reported desirous of closing for a heavy tonnage, but brokers hesitate to contract except at a considerably higher price, in view of their present difficulty in obtaining scrap. Borings and turnings are practically the only grade thus far unaffected by the upward movement. Although $12.50 to $13.50 is still the market on this grade, it is doubtful that new contracts could be made at this price.

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel	$18.00 to $19.00
Scrap rails	18.00 to 19.00
Steel rails for rolling	18.50 to 19.00
No. 1 low phos., heavy 0.04 and under	21.00 to 21.50
Couplers and knuckles	20.00 to 20.50
Rolled steel wheels	20.00 to 20.50
Cast-iron car wheels	17.50 to 18.00
No. 1 railroad wrought	18.50 to 19.00
No. 1 yard wrought	17.50 to 18.00
No. 1 forge fire	14.50 to 15.00
Bundled sheets (for steel works)	14.50 to 15.00
Mixed borings and turnings (for blast furnace use)	12.50 to 13.50
Machine shop turnings (for steel works use)	14.50 to 15.00
Machine shop turnings (for rolling mill use)	15.00 to 15.50
Heavy axle turnings (or equivalent)	15.00 to 16.00
Cast borings (for steel works and rolling mills)	14.50 to 15.00
Cast borings (for chemical plants)	17.50 to 18.00
No. 1 cast	18.00 to 18.50
Heavy breakable cast (for steel plants)	16.50 to 17.00
Railroad grate bars	15.00 to 15.50
Stove plate (for steel plant use)	15.00 to 15.50
Wrought iron and soft steel pipes and tubes (new specifications)	16.50 to 17.00
Shafting	24.00 to 25.00
Steel axles	24.00 to 25.00

Imports.—In the week ended Nov. 15 imports into the port of Philadelphia of iron ore totaled 13,711 gross tons, of which 6906 tons were from Sweden, 6232 tons from Spain and 573 tons from the Netherlands. A total of 1002 tons of pig iron came in from India, 4600 tons of chrome ore from Portuguese Africa, 200 tons of spiegeleisen and 400 tons of ferromanganese from the United Kingdom.

Chicago Iron and Steel Market

(*Concluded from page 1371*)

$17.50 delivered was the maximum price paid for heavy melting and as dealers are now asking a minimum of $18, buying has come to a halt for the time being. The trade is confident, however, that the increased requirements of the mills resulting from their heavier commitments will force them to pay the higher figure. The market has lost none of its buoyancy, although advances have not been so general as a week ago. Railroad offerings include the Grand Trunk Western, 600 tons; the Rock Island, 5500 tons, and the Soo Line, 800 tons.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Iron rails	$18.50 to $19.00
Cast iron car wheels	19.00 to 19.50
Relaying rails, 56 and 60 lb.	26.00 to 27.00
Relaying rails, 65 lb. and heavier	27.00 to 32.00
Forged steel car wheels	20.50 to 21.00
Railroad tires, charging box size	21.00 to 21.50
Railroad leaf springs, cut apart	20.50 to 21.00
Rails for rolling	18.50 to 19.00
Steel rails, less than 3 ft.	19.50 to 20.00
Heavy melting steel	17.25 to 17.75
Frogs, switches and guards cut apart	17.50 to 18.00
Shoveling steel	17.00 to 17.50
Drop forge flashings	12.50 to 13.00
Hydraulic compressed sheets	14.50 to 15.00
Axle turnings	15.00 to 15.50
Steel angle bars	18.50 to 19.00
Steel knuckles and couplers	20.00 to 21.50
Coil springs	21.50 to 22.00
Low phos. punchings	19.00 to 19.50
Machine shop turnings	11.00 to 11.50
Cast borings	13.00 to 13.50
Short shoveling turnings	13.00 to 13.50
Railroad malleable	19.00 to 19.50
Agricultural malleable	18.50 to 19.00
Per Net Ton	
Iron angle and splice bars	18.00 to 18.50
Iron arch bars and transoms	20.00 to 20.50
Iron car axles	26.00 to 26.50
Steel car axles	19.00 to 19.50
No. 1 busheling	13.50 to 14.00
No. 2 busheling	9.00 to 9.50
Pipes and flues	12.00 to 12.50
No. 1 railroad wrought	15.50 to 16.00
No. 2 railroad wrought	15.25 to 15.75
No. 1 machinery cast	18.00 to 18.50
No. 1 railroad cast	17.00 to 17.50
No. 1 agricultural cast	17.00 to 17.50
Locomotive tires, smooth	17.50 to 18.00
Stove plate	15.00 to 15.50
Grate bars	15.50 to 16.00
Brake shoes	15.50 to 16.00

Steel Pipe—Demand is commencing to taper off, as it usually does at this season when jobbers are preparing to take inventory. The recession in buying, however, is less marked than is ordinarily the case. Prices are firm and unchanged.

Cold-Finished Steel and Shafting.—Following the recent advance in hot-rolled bars, cold-finished steel is expected to advance $2 a ton to 2.80c., Chicago mill, before the close of the week. In the meantime, both automobile interests and other classes of buyers are making haste to cover their needs.

Alloy Steel Bars.—Demand from the automobile trade and others shows some improvement, but business is not yet comparable with that booked by mills rolling carbon bars. Local prices remain $2 above the prices at Pittsburgh and Youngstown as published on page 1381.

Coke.—Demand for by-product foundry coke has no new features outside of the placing of a number of first quarter contracts at the present price of $10.75 delivered, Chicago switching district. Shipments are steady, but are not increasing to the extent that would indicate any appreciable increase in melt on the part of foundries in this section.

Inland Steel Co. Plans to Build Two More Blast Furnaces

CHICAGO, Nov. 18.—The Inland Steel Co. has put out plans for two additional blast furnaces at Indiana Harbor, Ind. The company now has three stacks, of which one is being rebuilt. It is said that the issuance of the plans does not necessarily mean that the work will be undertaken at this time, as figures were taken once before without result.

Prices of Finished Iron and Steel Products (Carload Lots)

Tank Plates

F.o.b. Pittsburgh mills, base, per lb.....1.80c. to 1.90c.
F.o.b. Chicago, base, per lb.....2.10c.

Structural Shapes

F.o.b. Pittsburgh mills, base, per lb.....2.00c. to 2.10c.
F.o.b. Chicago, base, per lb.....2.10c.

Iron and Steel Bars

Soft steel bars f.o.b. P'gh mills, base, per lb....2.00c. to 2.10c.
Soft steel bars f.o.b. Chicago, base, per lb.....2.00c. to 2.10c.
Reinforcing steel bars f.o.b. P'gh mills, base, per lb. 2.00c. to 2.10c.
Rail steel bars f.o.b. Chicago district mills, base, per lb..2.00c.
Common iron bars delivered New York, base, per lb....2.34c.
Common iron bars f.o.b. Chicago, base, per lb.....2.10c.
Refined iron bars f.o.b. P'gh mills, base, per lb..2.90c. to 3.00c.
Common iron bars delivered Philadelphia, base, per lb..2.32c.

Hot-Rolled Flats

(Pittsburgh)

Hoops, base, per lb.....2.50c.
Bands, base, per lb.....2.40c. to 2.50c.
Strips, 10 in. and under, base, per lb.....2.25c.
Strips, less than 10 in. wide.....2.40c.

Cold-Finished Steel

Screw stock and shafting, f.o.b. P'gh mills, base, per lb..2.70c.
Screw stock and shafting f.o.b. Chicago mills, base, per lb.2.70c.
Screw stock and shafting Worster mills, base, per lb....2.90c.
Shafting, ground, f.o.b. mill, base, per lb.....3.10c.
Screw stock and shafting, base, per lb., Cleveland.....2.75c.
Strips, f.o.b. P'gh mills, base, per lb.....4.00c. to 4.15c.
Strips, f.o.b. Cleveland mills, base, per lb.....4.00c.
Strips, f.o.b. Chicago mills, base, per lb.....4.30c.
Strips, f.o.b. Worcester mills, base, per lb.....4.15c.

Wire Products

(To jobbers in car lots f.o.b. Pittsburgh and Cleveland)

Nails, base, per keg.....$2.75
Bright plain wire, base, No. 9 gage, per 100 lb..... 2.50
Annealed fence wire, base, per 100 lb..... 2.65
Galvanized wire No. 9, base, per 100 lb..... 3.10
Galvanized barbed, base, per 100 lb..... 3.45
Galvanized staples, base, per keg..... 3.45
Painted barbed wire, base, per 100 lb..... 3.20
Polished staples, base, per keg..... 3.20
Cement coated nails, base, per count keg.....$2.05 to 2.10
Woven wire fence, base, per net ton to retailers.....$65.00

Chicago district mill prices are $2 per ton above the foregoing and Chicago delivered prices are $3 per ton above the prices f.o.b. Cleveland and Pittsburgh. Birmingham mill prices $3 a ton higher; Worcester, Mass., mills $3 a ton higher on products of that plant, and Duluth, Minn., mills $2 a ton higher; Anderson, Ind., $1 higher.

Sheets

Blue Annealed

(base) per lb.

Nos. 9 and 10, f.o.b. Pittsburgh dist. mills.....2.60c. to 2.70c.
•Nos. 9 and 10 (base) per lb., f.o.b. Chicago dist mills..2.80c.

Box Annealed, One Pass Cold Rolled

No. 28 (base) per lb., f.o.b. Pittsburgh dist. mills.3.40c. to 3.60c.
•No. 28 (base) per lb., f.o.b. Chicago dist. mills.....3.60c.

Galvanized

No. 28 (base) per lb., f.o.b. Pittsburgh dist. mills.4.50c. to 4.70c.
•No. 28 (base) per lb., f.ob. Chicago dist mills.....4.70c.

Tin-Mill Black Plate

No. 28 (base) per lb., f.o.b. Pittsburgh dist. mills.3.40c. to 3.60c.
•No. 28 (base) per lb., f.ob. Chicago dist mills.....3.60c.

Automobile Body Sheets

No. 22 (base) per lb., f.o.b. mill.....4.60c. to 4.75c.

Long Ternes

No. 28 (base) 8-lb. coating, per lb., f.o.b. mill.....4.90c.

•Add 5c. per 100 lb. for delivery in Chicago.

Tin Plate

Standard cokes, per base box f.o.b. Pittsburgh district Mills $5.50
Standard cokes, per base box f.o.b. Chicago district mills 5.60
Standard cokes, per base box f.o.b. Elwood, Ind..... 5.60

Terne Plate

(F.o.b. Pittsburgh, district mills)
(Per Package, 20 x 28 in.)

8-lb coating, 100 lb. base $11.00	20-lb. coating I. C.....$14.90
8-lb. coating I. C..... 11.30	25-lb. coating I. C..... 16.20
12-lb. coating I. C..... 12.70	30-lb. coating I. C..... 17.35
15-lb. coating I. C..... 13.95	35-lb. coating I. C..... 18.35
	40-lb. coating I. C..... 19.35

Rivets

Large, f.o.b. P'gh and Cleveland mill, base, per 100 lb..$2.60
Large, f.o.b. Chicago mills, base, per 100 lb..... 2.75
Small, f.o.b. P'gh and Cleveland mills 70, 10 and 5 per cent off list
Small, f.o.b. Chicago mills.....70, 10 and 5 to 70 and 10 off list

Rails and Track Equipment

(F.o.b. mill)

Rails, standard, per gross ton.....$43.00
Rails, light, billet, base, per lb.....1.80c. to 1.90c.
Rails, light rail steel, base, per lb.....1.65c. to 1.75c.
Spikes, ⅝ in. and larger, base, per 100 lb.....$2.80 to $3.00
Spikes, ½ in. and smaller, base, per 100 lb.... 3.00 to 3.10
Spikes, boat and barge, base, per 100 lb..... 3.25
Track bolts, all sizes, base, per 100 lb..... 3.75 to 4.00
Track bolts, heat treated, base, per 100 lb..... 4.25 to 4.50
Tie plates, per 100 lb..... 2.40 to 2.50
Angle bars, base, per 100 lb..... 2.75

Welded Pipe

(F.o.b. Pittsburgh district mills)

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	45	19½	⅛ to ⅜.....+11		+39
¼ to ⅜.....	51	25½	½	22	2
½	56	42½	¾	28	11
¾	60	48½	1 to 1½.....	30	13
1 to 3.....	62	50½			

Lap Weld

2	55	43½	2	23	7
2½ to 6.....	59	47½	2½	26	11
7 and 8.....	56	43½	3 to 6.....	28	13
9 and 10....	54	41½	7 to 12.....	26	11
11 and 12...	53	40½			

Butt Weld, extra strong, plain ends

⅛	41	24½	2 to 3.....	61	50½
¼ to ⅜.....	47	30½	¼ to ⅜.....+11		+54
½	53	42½	½	21	7
¾	58	47½	¾	28	12
1 to 1½.....	60	49½	1 to 1½.....	30	14

Lap Weld, extra strong, plain ends

2	53	42	2	23	3
2½ to 4.....	57	46½	2½ to 4.....	29	15
4½ to 6.....	56	45½	4½ to 6.....	28	14
7 to 8.....	52	39½	7 to 8.....	21	7
9 and 10.....	45	32½	9 to 12.....	16	2
11 and 12....	44	31½			

To the large jobbing trade the above discounts are increased (on black) by one point, with supplementary discount of 5 per cent and (on galvanized) by 1½ points, with supplementary discount of 5 per cent.

NOTE—The above discounts on steel pipe also apply at Lorain and Youngstown, Ohio, and Wheeling, W. Va. Chicago district mills have a base 2 points less. Chicago delivered base 2½ points less.

Boiler Tubes

(F.o.b. Pittsburgh)

Lap Welded Steel		Charcoal Iron	
2 to 2¼ in.....	27	1½ in.....+18	
2½ to 2¾ in.....	37	1⅝ to 1⅞ in.....+ 8	
3 in.....	40	2 to 2¼ in.....— 2	
3¼ to 3¾ in.....	42½	2½ to 3 in.....— 7	
4 to 13 in.....	46	3¼ to 4½ in.....— 9	

Beyond the above discounts, 5 fives extra are given on lap welded steel tubes and 2 tens on charcoal iron tubes.

Standard Commercial Seamless Boiler Tubes
Cold Drawn

1 in.....	55-58	3 and 3¼ in.....	36-39
1¼ and 1½ in.....	47-50	3½ and 3¾ in.....	37-40
1¾ in.....	31-34	4 in.....	41-44
2 and 2¼ in.....	22-25	4½ in. and 5 in.....	33-37
2 and 2¾ in.....	32-35		

Hot Rolled

3 and 3¼ in.....	38-41	4-in.	43-46
3½ in. and 3¾ in....	39-42		

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

Carbon under 0.30 base.....85 to 87 per cent off list
Carbon 0.30 to 0.40, base.....83 to 85 per cent off list

Plus usual differentials and extras for cutting. Warehouse discounts range higher.

Seamless Locomotive and Superheater Tubes

	Cents per Ft.		Cents per Ft.
2-in. O.D. 12 gage....	15	2¼-in. O.D. 10 gage..	20
2-in. O.D. 11 gage....	16	3-in. O.D. 7 gage.....	35
2-in. O.D. 10 gage....	17	1½-in. O.D. 9 gage...	15
2¼-in. O.D. 12 gage..	17	5⅝-in. O.D. 9 gage...	55
2¼-in. O.D. 11 gage..	18	5½-in. O.D. 9 gage...	57

Prices of Raw Materials, Semi-Finished and Finished Products

Ores

Lake Superior Ores, Delivered Lower Lake Ports

Old range Bessemer, 55 per cent iron	$5.65
Old range non-Bessemer, 51½ per cent iron	4.90
Mesabi Bessemer, 55 per cent iron	5.40
Mesabi non-Bessemer, 51½ per cent iron	4.75

Foreign Ore, per Unit, c.i.f. Philadelphia or Baltimore

Iron ore, low phos., copper free, 55 to 58 per cent iron in dry Spanish or Algerian	9.00c. to 9.50c.
Iron ore, Swedish, average 66 per cent iron	9.50c.
Manganese ore, washed, 51 per cent manganese, from the Caucasus, nominal	42c.
Manganese ore, ordinary, 48 per cent manganese from the Caucasus	40c.
Manganese ore, Brazilian or Indian, nominal	42c.
Tungsten ore, high grade, per unit, in 60 per cent concentrates	$8.00 to $8.50
Chrome ore, basic, 48 per cent Cr_2O_3, crude, per ton, c.i.f., Atlantic seaboard	18.50 to 24.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS_2, New York	80c.

Coke and Coal

(Per Net Ton)

Furnace coke, f.o.b. Connellsville	$3.00 to $3.25
Foundry coke, f.o.b. Connellsville	4.00 to 4.50
Mine run steam coal, f.o.b. W. Pa. mines	1.50 to 2.10
Mine run coking coal, f.o.b. W. Pa. mines	1.60 to 1.85
Mine run gas coal, f.o.b. W. Pa. mines	2.00 to 2.25
Steam slack, f.o.b. W. Pa. mines	1.00 to 1.10
Gas slack, f.o.b. W. Pa. mines	1.15 to 1.30

Ferroalloys

Ferromanganese, domestic, 80 per cent, furnace, or seaboard, per ton	$100.00 to $105.00
Ferromanganese, foreign, 80 per cent, f.o.b. Atlantic port, duty paid	100.00 to 105.00
Ferrosilicon, 50 per cent, delivered	70.00 to 75.00
Ferrosilicon, 75 per cent	140.00
Ferrotungsten, per lb. contained metal	87c. to 90c.
Ferrochromium, 4 to 6 per cent carbon, 60 to 70 per cent Cr. per lb. contained Cr. delivered	10.75c.
Ferrochromium, 6 to 7 per cent carbon, 60 to 70 per cent Cr., per lb.	10.50c.
Ferrovanadium, per lb. contained vanadium	$3.50 to $4.00
Ferrocarbontitanium, 15 to 18 per cent, per net ton	200.00

Spiegeleisen, Bessemer Ferrosilicon and Silvery Iron

(Per gross ton furnace unless otherwise stated.)

Spiegeleisen, domestic, 19 to 21 per cent, $30.00 to $32.00
Spiegeleisen, domestic, 16 to 19 per cent, 29.00 to 31.00
Ferrosilicon, Bessemer, 10 per cent, $39.50; 11 per cent, $42; 12 per cent, $44.50; 14 to 16 per cent (electric furnace), $36.00.

Silvery iron, 5 per cent, $27.00; 6 per cent, $28.00; 7 per cent, $29.00; 8 per cent, $29.00 to $30.00; 9 per cent, $32.50; 10 per cent, $34.50; 11 per cent, $37.00; 12 per cent, $39.50.

Fluxes and Refractories

Fluorspar, 80 per cent and over calcium fluoride, not over 5 per cent silica, per net ton, f.o.b. Illinois and Kentucky mines	$17.50
Fluorspar, 85 per cent and over calcium fluoride, not over 5 per cent silica, per net ton f.o.b. Illinois and Kentucky mines	18.50
Fluorspar, foreign, 85 per cent calcium fluoride, not over 5 per cent silica, c.i.f. Philadelphia, duty paid, per gross ton	19.75

Per 1000 f.o.b. works:

Fire Clay:	High Duty	Moderate Duty
Pennsylvania	$40.00 to $43.00	$36.00 to $40.00
Maryland	45.00 to 47.00	40.00 to 42.00
Ohio	40.00 to 43.00	37.00 to 39.00
Kentucky	42.00 to 43.00	37.00 to 39.00
Illinois		37.00 to 42.00
Missouri	42.00 to 45.00	35.00 to 40.00
Illinois	42.00 to 45.00	
Ground fire clay, per net ton	6.00 to	7.00
Silica Brick:		
Pennsylvania		33.00
Chicago	43.00 to	44.00
Birmingham		50.00
Ground silica clay, per net ton	7.50 to	8.00
Magnesite Brick:		
Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.)		65.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.)		40.00
Chrome Brick:		
Standard size, per net ton		45.00

Bolts and Nuts

(F.o.b. Chicago and Pittsburgh)

Machine bolts, small rolled threads..60 and 20 per cent off list
Machine bolts, all sizes, cut threads..60 and 10 per cent off list
Carriage bolts, smaller and shorter, rolled threads, 60 and 10 per cent off list
Carriage bolts, cut threads, all sizes.....60 per cent off list
Eagle carriage bolts.....65, 10 and 10 per cent off list
Lag bolts.....70 per cent off list
Plow bolts, Nos. 1, 2 and 3 heads..50, 10 and 5 per cent off list
Other style heads.....20 per cent extra
Machine bolts, c.p.c. and t. nuts, ⅜ x 4 in. 50, 10 and 5 per cent off list
Larger and longer sizes.....60, 10 and 5 per cent off list
Hot-pressed nuts, blank or tapped, square.....4.50c. off list
Hot-pressed nuts, blank or tapped, hexagons..5 per cent off list
C.p.c. and t. square or hex. nuts, blank or tapped..4.50c. off list
Eagle carriage bolts.....65, 10 and 10 per cent off list
Plow bolts.....50, 10 and 5 per cent off list
Semi-finished hex. nuts:
½ in. and smaller, U. S. S....30, 10, 10 and 5 per cent off list
⅝ in. and larger, U. S. S....75, 10, 10 and 5 per cent off list
Small sizes, S. A. E.....30, 10, 10, 10 and 5 per cent off list
S. A. E., ⅜ in. and larger.....30, 10 and 5 per cent off list
Stove bolts in packages.....30, 10 and 5 per cent off list
Stove bolts in bulk.....30, 10, 5 and 2½ per cent off list
Tire bolts.....60 and 10 per cent off list
Bolt ends with hot pressed nuts.....60 and 10 per cent off list
Bolt ends with cold pressed nuts....50 and 10 per cent off list
Washers.....6.00c. to 6.25c. off list
Lock washers.....30 per cent off list

Foregoing prices are quoted f.o.b. Cleveland by Cleveland manufacturers for Cleveland delivery.

Semi-Finished Castellated and Slotted Nuts

(F.o.b. Chicago and Pittsburgh)

(To jobbers and consumers in large quantities)

	Per 1000 S. A. E.	Per 1000 U. S. S.		Per 1000 S. A. E.	Per 1000 U. S. S.
¼-in.	$4.25	$4.25	⅞-in.	$13.25	$13.50
5/16-in.	4.90	4.90	1-in.	16.25	16.50
⅜-in.	5.90	6.25	1⅛-in.	22.50	23.00
7/16-in.	7.50	8.50	1¼-in.	34.00	34.00
½-in.	9.75	10.00	1⅜-in.	53.00	55.00

Larger sizes—Prices on application.

Cap and Set Screws

(F.o.b. shipping point.)

Milled hex. cap screws.....85 and 10 per cent off list
Milled standard set screws, case hardened 85 and 10 per cent off list
Milled headless set screws, cut thread, 85 and 10 per cent off list
Upset hex. head cap screws, U. S. S. thread, 85, 10, 10 and 5 per cent off list
Upset hex. head cap screws, S. A. E. thread, 85, 10, 10 and 5 per cent off list
Milled studs.....80 and 10 per cent off list

Semi-Finished Steel, f.o.b. Pittsburgh or Youngstown, per gross ton

Rolling billets, 4-in. and over	$35.50
Forging billets, ordinary carbons	40.50
Sheet bars, Bessemer	37.00 to 37.50
Sheet bars, open hearth	37.00 to 37.50
Slabs	35.50
*Wire rods, common soft, base, No. 5 to ⅜-in.	45.00 to 46.00
Wire rods, common soft, coarser than ⅜-in.	$3.50 over base
Wire rods, screw stock	$5.00 per ton over base
Wire rods, carbon 0.20 to 0.40	3.00 per ton over base
Wire rods, carbon 0.41 to 0.55	5.00 per ton over base
Wire rods, carbon 0.56 to 0.75	7.50 per ton over base
Wire rods, carbon over 0.75	10.00 per ton over base
Wire rods, acid	15.00 per ton over base
Skelp, grooved, per lb.	1.90c. to 2c.
Skelp, sheared, per lb.	1.90c. to 2c.
Skelp, universal, per lb.	1.90c. to 2c.

*Chicago mill base is $47.00.

Alloy Steel

(F.o.b. Pittsburgh or mill)

S. A. E. Series Numbers	Bars 100 lb.
2100* (1¼% Nickel, 10 to 20 per cent Carbon)	$3.00 to $3.25
2300 (3½% Nickel)	4.75
2500 (5% Nickel)	6.50
3100 (Nickel Chromium)	3.45 to 3.75
3200 (Nickel Chromium)	5.50 to 5.75
3300 (Nickel Chromium)	7.75
3400 (Nickel Chromium)	6.75
5100 (Chromium Steel)	3.50 to 3.75
5200* (Chromium Steel)	7.50 to 8.00
6100 (Chromium Vanadium bars)	4.50
6100 (Chromium Vanadium spring steel)	4.25 to 4.50
9250 (Silicon Manganese spring steel)	3.50 to 3.75
Carbon Vanadium (0.45 to 0.55 Carbon, 0.15 Vanadium)	4c.
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chromium, 0.15 Vanadium)	4.50
Chromium Molybdenum bars (0.80—1.10 Chromium, 0.25—0.40 Molybdenum)	4.25 to 4.50
Chromium Molybdenum bars (0.50—0.70 Chromium, 0.15—0.25 Molybdenum)	3.75 to 4.25
Chromium Molybdenum spring steel (1—1.25 Chromium, 0.30—0.50 Molybdenum)	4.75 to 5.00

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10-in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4-in. down to and including 2½-in. squares, the price is $5 a gross ton above the 4 x 4 billet price.

*Not S.A.E. specifications, but numbered by manufacturers to conform to S.A.E. system.

Freight Rates on Finished Steel from Leading Producing Centers to Various Consuming Points

CONTINUING the publication of freight rates on finished steel products, interest in which has been intensified by the abolition of Pittsburgh as a sole price basing point and the setting up of several basings, THE IRON AGE *this week presents the rates on welded pipe to various destinations throughout the United States. These rates are for lots of a carload, which to some points means a minimum lading of 36,000 lb. and to others 46,000 lb. There are basings on pipe at Pittsburgh, Lorain, Evanston, Ill., and Indiana Harbor, Ind. On steel pipe, the freight is figured from the producing center having the lowest freight to destination. A consumer nearer Chicago district mills than those in the Pittsburgh district would be billed from the Chicago district mills, although the pipe might be shipped from Pittsburgh, Wheeling, Youngstown or Lorain. The market on welded iron pipe still is on an f. o. b. Pittsburgh base and freight is to be figured from that point.*

Destination	Producing Points: Pittsburgh	Lorain	Evanston, Ill. Indiana Harbor
Alabama			
Birmingham	$0.58	$0.57	$0.53
Mobile	0.67	0.65	0.57
Arizona			
Phoenix	1.15	1.15	1.00
Arkansas			
Little Rock	0.75	0.70	0.56
Smackover	0.82	0.77	0.60
California			
Los Angeles	1.15	1.15	1.00
San Francisco	1.15	1.15	1.00
Torrence	1.15	1.15	1.00
Colorado			
Denver	1.15	1.08	0.82
Pueblo	1.15	1.08	0.82
Florida			
Jacksonville (all rail)	0.70	0.70	...
(rail and water)	0.415	0.455	...
Tampa (all rail)	0.955	0.87	...
(rail and water)	0.61	0.67	...
Georgia			
Atlanta	0.67	0.66	0.67
Savannah (rail and water)	0.415	0.455	0.67
(all rail)	0.66	0.68	...
Idaho			
Common Points	1.15	1.15	1.00
Illinois			
Chicago	0.34	0.29	...
Peoria	0.385	0.33	0.155
Moline	0.43	0.355	0.175
Springfield	0.41	0.33	0.175
Indiana			
Anderson	0.305	0.26	0.24
Evansville	0.36	0.34	0.28
Indianapolis	0.31	0.275	0.25
Kokomo	0.31	0.27	0.215
Hammond	0.34	0.29	0.025
Muncie	0.30	0.255	0.25
Terre Haute	0.34	0.30	0.24
Ft. Wayne	0.29	0.235	0.22
South Bend	0.32	0.265	0.185
Iowa			
Des Moines	0.585	0.51	0.295
Sioux City	0.69	0.63	0.35
Kansas			
Hutchinson	0.88	0.84	0.585
Leavenworth	0.65	0.63	0.35
Topeka	0.775	0.70	0.445
Wichita	0.885	0.84	0.585
Kentucky			
Ashland	0.28	0.275	0.32
Louisville	0.33	0.405	0.41
Louisiana			
New Orleans	0.67	0.65	0.57
Shreveport	0.79	0.76	0.63
Maryland			
Baltimore	0.31	0.37	...
Cumberland	0.155	...	...
Michigan			
Detroit	0.29	0.215	0.275
Flint	0.32	0.26	0.29
Minnesota			
Duluth	0.60	0.56	0.305
St. Paul	0.60	0.56	0.275
Minneapolis	0.60	0.56	0.275
Mississippi			
Jackson	0.64	0.61	0.53
Missouri			
Kansas City	0.69	0.615	0.35
St. Louis	0.69	0.63	0.175
Montana			
Common Points	1.15	1.15	100
Nebraska			
Omaha	0.69	0.615	0.35
New England			
Common Points	0.365	0.43	...
New York			
New York	0.34	0.40	...
Buffalo	0.265	0.255	...
Syracuse	0.285	0.325	...
New Jersey			
Camden	0.32	...	0.545
Newark	0.34	...	0.565
North Carolina			
Common Points	0.48	0.51	0.59
Ohio			
Akron	0.19	0.09	0.30
Canton	0.19	0.095	0.31
Cleveland	0.19	0.07	0.30
Cincinnati	0.29	0.265	0.28
Dayton	0.275	0.24	0.275
Columbus	0.25	0.19	0.29
Mansfield	0.24	0.165	0.285
Portsmouth	0.28	0.275	0.32
Toledo	0.27	0.18	0.265
Youngstown	0.095	0.095	0.32
Zanesville	0.23	0.22	0.31
Oklahoma			
Muskogee	0.84	0.79	0.69
Tulsa	0.885	0.84	0.69
Oregon			
Portland	1.15	1.15	1.00
Pennsylvania			
Bethlehem	0.32	...	...
Philadelphia	0.32	...	...
Pittsburgh	...	0.19	0.34
Reading	0.32	0.38	...
South Carolina			
Charleston	0.58	0.62	0.70
South Dakota			
Aberdeen	0.89	0.82	0.55
Tennessee			
Chattanooga	0.50	0.50	0.49
Memphis	0.56	0.53	0.42
Texas			
Beaumont	0.705	0.655	0.49
Dallas	0.89	0.84	0.69
Galveston	0.705	0.655	0.49
Houston	0.705	0.655	0.49
Utah			
Common Points	1.15	1.15	0.95
Virginia			
Norfolk	0.48	0.405	0.535
Newport News	0.38	0.405	...
Washington			
Common Points	1.15	1.15	1.00
West Virginia			
Charleston	0.285	0.285	0.34
Morgantown	0.19	0.27	0.36
Wheeling	0.11	0.23	0.34
Wisconsin			
Milwaukee	0.37	0.32	0.08
Wyoming			
Casper	1.15	1.15	0.835
Rawlins	1.15	1.15	0.90

NON-FERROUS METALS

The Week's Prices

Cents per Pound for Early Delivery

	Copper, New York		Straits Tin (Spot)	Lead		Zinc	
Nov.	Lake	Electrolytic*	New York	New York	St. Louis	New York	St. Louis
12.....	13.87½	13.62½	54.37½	8.90	8.87½	7.12½	6.77½
13.....	14.00	13.62½	54.00	9.00	8.87½	7.20	6.85
14.....	14.00	13.62½	54.75	9.00	8.87½	7.25	6.90
15.....	14.00	13.62½	.....	9.00	8.87½	7.25	6.90
17.....	14.00	13.62½	54.62½	9.00	8.87½	7.25	6.90
18.....	14.00	13.75	54.75	9.00	8.87½	7.27½	6.92½

*Refinery quotation; delivered price ¼c. higher.

New York

NEW YORK, Nov. 18.

The markets are all moderately active and prices are strong. Good demand for copper continues to slowly lift the quotation. Tin prices are a little higher with buying of good proportions. The lead market continues slightly easy with very little change in values. Zinc prices have advanced sharply in the past week, with buying of large proportions.

Copper.—Electrolytic copper has finally reached 14c., delivered. Today there were no large producers willing to quote less than this, and it was generally conceded that the metal could not be bought for less from any other source. Both domestic and foreign demand continues in fairly large volume. That the market will reach the 15c. level within two months is the optimistic prediction of some producers. Lake copper is quoted from 14c. to 14.12½c., delivered.

Tin.—Buying of Straits tin has been fairly heavy, with the total for the week covered by this report estimated at 1400 to 1500 tons. The heaviest buying was on Friday, Nov. 14, when 600 to 700 tons changed hands, the bulk being taken by tin plate consumers at 54.50 to 54.75c. Most of this was for prompt and December delivery out of New York, indicating low stocks. Yesterday about 150 tons changed hands, also taken by consumers, much of it covering a period up to and including April delivery from New York. The market today was fairly active, due partly to lower prices in London, which were £257 15s. for spot standard, £260 15s. for future standard and £259 15s. for spot Straits. The Singapore price yesterday was £265. Spot Straits tin was quoted today at 54.75c., New York. Arrivals thus far this month have been 4180 tons, with 4315 reported afloat.

Lead.—Again the situation has changed but little, with prices practically the same as a week ago. The leading interest continues to maintain its contract price at 8.65c., New York. Prices in the outside market vary widely and depend almost wholly on the relation between the buyer and seller in each case. A fair average is 8.87c., St. Louis, or 9c., New York.

Old Metals.—Business continues active, with German demand the chief factor. Dealers' selling prices are as follows in cents per lb.:

Copper, heavy and crucible	13.25
Copper, heavy and wire	12.25
Copper, light and bottoms	11.00
Heavy machine composition	10.50
Brass, heavy	9.00
Brass, light	7.50
No. 1 red brass or composition turnings	9.00
No. 1 yellow rod brass turnings	9.00
Lead, heavy	8.25
Lead, tea	7.00
Zinc	4.25
Cast aluminum	17.50
Sheet aluminum	17.50

Zinc.—An advance of about 20 points has been registered in prime Western zinc and quotations are higher than they have been in many months. Sustained foreign demand has been combined with larger domestic buying and the metal is quoted at 6.92½c., St. Louis, or 7.27½c., New York.

Nickel.—Shot and ingot nickel in wholesale lots are quoted unchanged at 29c. to 30c. per lb., with electrolytic nickel quoted at 33c.

Antimony.—Due to the fact that Chinese metal is closely held, quotations have advanced to 15c. per lb., duty paid, for wholesale lots.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted at 27c. to 28c., duty paid, delivered.

Chicago

Nov. 18.—All of the metals have advanced except lead which has developed unexpected weakness and has declined. The recession of lead was brought on by the sale of material for December delivery at less than the current prices. Antimony is particularly strong and sharp advances are looked for inasmuch as very little is afloat and it takes two or three months to get shipments under way. Among the old metals only the copper and brass grades have advanced. We quote in carload lots: Lake copper, 14.37½c.; tin, 56c.; lead, 9.05c.; spelter, 6.95c.; antimony, 16.50c., in less than carload lots. On old metals we quote copper wire, crucible shapes and copper clips, 11.25c.; copper bottoms, 9.75c.; red brass, 8.75c.; yellow brass, 7.50c.; lead pipe, 7.75c.; zinc, 4.25c.; pewter, No. 1, 26c.; tin foil, 32c.; block tin, 43c.; all buying prices for less than carload lots.

New Buffalo Rule as to Use of Reinforcing Rail Steel Bars

BUFFALO, Nov. 18.—After considerable deliberation as to the question of permitting the use of bent reinforcing bars, rolled from rail steel, rather than from billet steel, the city council has approved the use of rail steel for bent reinforcing bars, provided that all bends be made when material is cold and further it shall be tested by a recognized testing laboratory and conform to A. S. T. M. specifications.

Following is the extract from the amended code:

"Subdivision 7.—Materials made from billets or rail steel shall be used for reinforcement in concrete; and in all cases where bending is required in such use, all bends must be made when the material is cold.

"Except as hereinbefore provided, all concrete reinforcement bars, when required by the building commissioner, shall be tested by a recognized testing laboratory and must comply with the standard specifications of the American Society for Testing Materials for steel reinforcement bars, under serial designations A-15-14 or A-16-14 or any subsequent revisions thereof."

Gases in Sheet Steel for Welding

Manufacturers of oxy-acetylene welded sheet steel products (tubes, barrels, etc.) encounter certain lots of sheet which give unsatisfactory welds, apparently on account of the evolution of gas as the molten weld metal freezes. Samples of satisfactory and unsatisfactory sheet steel have been submitted to the Bureau of Standards by a tube manufacturer, and similar samples have been promised by a manufacturer of welded steel barrels. One manufacturer has stated that there is some evidence that an aluminum-treated steel is quite liable to give poor welding sheet. Analyses are in progress to determine if any difference exists in the gas content of these two grades of welding steels.

Work has just been started by the H. K. Ferguson Co., Cleveland, on the erection of a new warehouse and machine shop for the Bourne-Fuller Co., that city, which will provide new floor space of approximately 50,000 sq. ft. The buildings are located at the Upson Nut plant of the Bourne-Fuller Co. in the Scranton Avenue industrial district. The new warehouse-machine shop will cost about $150,000. It is to be four stories, 70 by 176 ft. The H. K. Ferguson Co. has agreed to complete the entire job within 100 working days.

EMPLOYEE REPRESENTATION

Conference of Production Executives at Cleveland Show Progress Is Being Made

A conference on employee representation was held at the Hotel Winton, Cleveland, Nov. 13 and 14 by the production executives division of the American Management Association. This was the first meeting held by the association to discuss this topic and it brought together over 250 employment and other executives, including a large number affiliated with steel plants and various other metal working industries. The meeting, as intended, provided a clearing house for the exchange of ideas and the various phases of employee representation were discussed at considerable length. The speakers felt free to express their views and experiences very frankly, as it was arranged that there would be no publicity given the discussions.

Opening remarks were made by Charles R. Hook, vice-president and general manager of the American Rolling Mill Co., Middletown, Ohio, who is vice-president in charge of the production executives' division. Mr. Hook emphasized the importance of the management having the right spirit behind an employee representation plan and of working out the necessary details to make the plan operative and successful. Other speakers at the regular sessions included T. H. White, manager industrial relations, American Multigraph Co., Cleveland, and C. Slusser, factory staff manager, Goodyear Tire & Rubber Co., Akron, Ohio. F. L. Sweetzer, general manager, Duchess Mfg. Co., Poughkeepsie, N. Y., said he did not regard it as necessary to have employee representation in a small plant employing around 500 men until trouble developed which showed the necessity of having some channel through which employees could express their views. Dr. A. A. Mitten, manager of industrial relations Philadelphia Rapid Transit Co., pointed out that employee representation is of interest not only to the company adopting it, but to the general public, which can operate under an employee representation plan.

Colorado's Experience

Speakers at an informal dinner Thursday evening included A. H. Lichty, vice-president Colorado Fuel & Iron Co., Denver, and Dr. Charles A. Eaton, director of industrial relations, National Lamp Works, Cleveland. Mr. Lichty stated that for more than eight years joint representation had been in effect at his company's plant and with decided success. "During this time all disputes we have had have been settled amicably," he said, "and most have been adjusted at their source. It is clearly the responsibility of company officials to see that the attitude of foremen and superintendents toward joint representation is right. Joint representation is not perfect. There are some selfish and inconsiderate men but none of these is impossible. The future of joint representation is one of large promise for all concerned."

Dr. Eaton defined progress as the growing share of more and more people in the good things of life, and Chairman Charles R. Hook, who presided at the dinner, declared "If we establish sound business conditions we can take away much of the fire of the agitators."

Various Problems Considered

One session was devoted to the discussion of various topics relating to the administrative details and problems of employee representation, the main general topics discussed being organization, early stages of development, current administration, results secured, problems met and dangers to avoid. Some of the specific topics that were taken up included who should operate plant, superintendent or personnel department; should the organization have power of recommendation only; does employee representation limit the foreman's power; do employees take an interest in council matters; do the workers take the elections seriously; improved working conditions; more intelligent workmen; difficulty in getting representatives to speak freely and how far should employee representation go.

It is stated that 1,250,000 employees are working under employee representation in the United States exclusive of the Post Office Department and that the plan is used in over 800 plants. The production executives division plans to hold another conference to discuss another general topic, "Financial Incentives for Employees." This will probably be held in Chicago next spring. The association's list of companies in the metal working field which have adopted employee representation includes, among others, the following: American Cast Iron & Pipe Co., American Rolling Mill Co., American Stove Co., American Multigraph Co., Bethlehem Steel Co., S. F. Bowser & Co., Bridgeport Malleable Iron Co., Chicago Bridge & Iron Co., Colorado Fuel & Iron Co., Commonwealth Steel Co., Doehler Die Casting Co., General Electric Co., Inland Steel Co., International Harvester Co., Midvale Steel & Ordnance Co., Mueller Metals Co., Taylor-Wharton Iron & Steel Corporation, Timken-Detroit Axle Co., United Alloy Steel Corporation, Virginia Bridge & Iron Co., Walworth Mfg. Co., Westinghouse Air Brake Co., Westinghouse Electric & Mfg. Co., Wheeling Steel Corporation, White Motor Co., Willys-Overland Co. and Youngstown Sheet & Tube Co.

OCTOBER STRUCTURAL SALES

Represent 66 Per Cent of Capacity Against 49 One Year Ago

WASHINGTON, Nov. 18.—The Department of Commerce announces sales of fabricated structural steel for October, based on figures received from the principal fabricators, as 66 per cent of capacity, with total bookings of 157,956 tons reported by firms with a capacity of 238,830 tons per month. Shipments of firms reporting this item represented 77 per cent of capacity, as against 74 per cent in September.

The table below lists the statistics reported by 189 identical firms (including data in earlier months for nine firms out of business), with a present capacity of 245,640 tons per month, comparing with 250,040 in 1923 and 241,715 in 1922. For comparative purposes, the percentage figures are prorated to obtain an estimated total for the United States, based on a capacity of 260,000 tons per month in 1923 and 1924.

1923	Actual Tonnage	Per Cent of Capacity	Computed Tonnage
January	179,375	72	187,200
February	192,569	77	200,200
March	230,085	92	239,200
April	193,932	78	202,800
May	140,681	56	145,600
June	125,993	50	130,000
July	125,344	50	130,000
August	143,814	58	150,800
September	130,239	52	135,200
October	122,153	49	127,400
November	132,772	54	140,400
December	195,721	79	205,400
1924			
January	176,058	72	187,200
February	179,956	73	189,800
March	174,663	71	184,600
April	160,267	65	169,000
May	145,820	59	153,400
June	161,763	66	171,600
July	170,884	70	182,000
August	146,875	60	156,000
September	[1] 165,343	68	176,800
October	[2] 157,956	66	171,600

[1] Reported by 186 firms with a capacity of 244,890 tons.
[2] Reported by 165 firms with a capacity of 238,830 tons.

Increasing Furnace Operations

The Carnegie Steel Co. has ordered No. 2 blast furnace in its Farrell, Pa., group in commission, bringing the active list in the Youngstown district to 23, of 45. Of the active furnaces, the Carnegie company is operating 10, the independent steel-making interests 10, and merchant producers three. The Republic Iron & Steel Co. started to pour from No. 5 stack in its Haselton group this week, giving it three active furnaces of five in this complement. No. 4 stack in the Republic company's Haselton group is ready for lighting, but its resumption is improbable for some time, as the company has substantial cold iron stocks in its yards. The Republic company is operating 11 open-hearth furnaces this week, against an average of six to eight during the summer and fall months.

PERSONAL

H. A. Barren has been appointed general superintendent and Jay Waldeck assistant general superintendent of the American Steel & Wire Co., both appointments becoming effective Nov. 11. Mr. Barren for a number of years has been manager of the company's blast furnaces in the Cleveland and Pittsburgh districts and as in the past, will divide his time largely between Cleveland and Pittsburgh. Mr. Waldeck has been manager of the company's wire mills in the Cleveland district.

G. E. Emmons, vice-president in charge of manufacturing of the General Electric Co., who has been identified with the electrical industry since 1886, plans to move soon from Schenectady to Pasadena, Cal., which will be his home.

J. Holden Wilson, vice-president Syracuse Trust Co., Syracuse, N. Y., with which he has been connected for the past 14 years, has resigned and will become president of the Houser Elevator Mfg. Co., Syracuse, succeeding the late C. C. Decker.

Emil Winter, president Pittsburgh Steel Products Co. and vice-president Pittsburgh Steel Co., Pittsburgh, has been appointed a member of the Pittsburgh Art Commission to fill the vacancy created by the death of Willis McCook, who at the time of his death was president of the Pittsburgh Steel Co.

William A. Viall, Henry Buker and Paul C. DeWolf were elected vice-presidents of the Brown & Sharpe Mfg. Co., Providence, R. I., at a recent meeting of stockholders. John A. Cave was elected secretary, and John Sharpe Chafee and Richmond Viall are assistant secretaries. Henry D. Sharpe continues as president and treasurer. Mr. Viall was formerly secretary and Mr. Buker was sales manager.

George A. Henderson, consulting engineer with the Ordnance Department, U. S. Army, has resigned to go into private practice in New York, his office being located at 51 West Sixty-sixth Street. He will specialize in safety methods as applied to construction, industrial plants and celluloid, chemical and explosive manufacture.

F. H. Bourke, who has served as salesman for several years with the American Nickeloid Co., Peru, Ill., has been appointed Michigan representative.

Alfred G. Norris has been appointed manager of the New England office of the Strom Ball Bearing Mfg. Co., Chicago, with offices at 75 Pearl Street, Hartford, Conn. He has been identified with the ball bearing industry for several years. A. W. Wiese, sales engineer of the Strom company, has been transferred from the Philadelphia office to the new office at Hartford.

O. C. MacMillan, formerly assistant manager of the order department, Inland Steel Co., Chicago, has become associated with S. W. Lindheimer, Chicago, in the sale of rails, frogs and switches and track fastenings.

H. L. Raynor, for the past few years associated with the Indianapolis office of the Crucible Steel Co. of America, has been made manager of the Boston office, with headquarters at 381 Congress Street.

Marcus A. Grossmann has become affiliated with the metallurgical department of the United Alloy Steel Corporation, Canton, Ohio, in charge of the research division. Since his graduation from the Massachusetts Institute of Technology in 1911, Mr. Grossmann has been actively engaged in research work, specializing in alloy steels. He was formerly chief metallurgist of the Electric Alloys Steel Co. and the Atlas Steel Corporation.

N. P. Farrar, who has been district manager in the Philadelphia territory for the Pawling & Harnischfeger Co., Milwaukee, has been appointed assistant sales manager, and H. L. Mode, for seven years in the motor department of the General Electric Co., becomes representative in the Eastern territory, with headquarters in New York and Philadelphia.

Maurice Owens, formerly with the Syracuse Supply Co. and in the mechanical department of the Continental Can Co., has been appointed sales engineer of Crane-Schiefer-Owens, Inc., 501 Morgan Building, Buffalo. He will be associated with Joseph F. Owens, manager of the Syracuse office.

OBITUARY

PATRICK F. BANNON, vice-president and superintendent of the Waterbury Farrel Foundry & Machine Co., Waterbury, Conn., died suddenly of acute indigestion on Sunday morning, Oct. 19. He was born in Waterbury in 1855, and at the age of 12 began his long business career by entering the employ of the Holmes, Booth & Hayden Mfg. Co., followed by short periods with the Scovill Mfg. Co. and Brown Brothers, all of Waterbury. He was empoyed at the plant of Waterbury Farrel company, in 1874 as an apprentice machinist and in 1906 he became general superintendent of the plant. Five years later he was made a director and in 1919 became vice-president. Mr. Bannon was actively interested in municipal projects and in the general public welfare of his native city, having served as city treasurer, member of the Board of Finance, member of the Common Council, City Hall Commissioner, and a member of the Waterbury Chamber of Commerce, of which he was a director at the time of his death. He is survived by his wife, a daughter, and two sons, William T. Bannon and Richard C. Bannon.

PATRICK F. BANNON

EMERY E. ELLIS, president and general manager Union Tool Co., Orange, Mass., died Saturday morning, Nov. 15, following an operation for appendicitis. Mr. Ellis was in his fifty-fourth year.

HENRY KEPPEL, aged 87 years, a director prominent in the management of the Corry-Jamestown Mfg. Co., manufacturer of metal furniture, Corry, Pa., died at his home in that city on Nov. 11.

JOHN MCLAUGHLIN, JR., El Paso, Tex., sales manager of the Hils-Sutton Co., manufacturer of tanks, culverts and other metal products, died at his home in that city Nov. 12, aged 31 years. Prior to his connection with the Hils-Sutton Co. he was buyer for the Momsen-Dunnegan-Ryan Co., El Paso, machinery and wholesale hardware dealer.

SAMUEL DOUBT, for more than 30 years identified with Manning, Maxwell & Moore, Inc., Pittsburgh, died at his home in Aspinwall, Pa., Nov. 9. He was born in England 78 years ago, but came to this country with his parents when a boy. For several years prior to joining Manning, Maxwell & Moore, he was associated with the Fairbanks Scale Co. in its Pittsburgh office.

FRANK H. CRAWFORD, of the firm of F. H. Crawford & Co., machinery merchants, 299 Broadway, New York, died after a brief illness on Nov. 13, aged 43 years. He was a graduate of the City College of New York and started his career in the accounting department of the Carnegie Steel Co. at Pittsburgh. He was one time sales manager of F. H. Niles & Co., machinery dealers, New York. In 1920 he organized F. H. Crawford & Co.

FABRICATED STEEL BUSINESS

New Projects at 45,000 Tons Largest in Two Months—Over 25,000 Tons of Awards

Fresh inquiries for over 45,000 tons are the feature of the week's developments. This is the largest total in over two months. Outstanding is the 25,000 tons for the Santa Fe System's bridge requirements for 1925. Awards totaling over 25,000 tons rank close to the highest in the last two months.

Apartment house, Park Avenue and Sixtieth Street, New York, 1000 tons, to Hay Foundry & Iron Works.

Garage, King & Charlton Streets, New York, 300 tons, to Levering & Garrigues Co.

J. G. White Engineering Corporation, New York, hotel at Glens Falls, N. Y., 300 tons, to Bethlehem Construction Co.

Medical Arts Building, Philadelphia, addition, 600 tons, to New York Shipbuilding & Dry Dock Co.

Underpinning & Foundation Co., New York, Bushwick Avenue section of subway, Brooklyn, N. Y., 3000 tons, to American Bridge Co.

Oakdale Construction Co., New York, Wyckoff Avenue section of subway, Brooklyn, N. Y., 3300 tons to American Bridge Co.

New York-New Jersey vehicular tunnel, New Jersey approach, 3550 tons, low bidder Booth & Flynn, Inc.; New York approach, 100 tons, low bidder Rogers & Haggerty.

Christian Science Church, Newton, Mass., 100 tons to New England Structural Co.

Beals, McCarthy & Rogers, Buffalo, warehouse, 700 tons, to R. S. McMannus Steel Construction Co.

Louisville & Nashville Railroad, girder spans, 90 tons, to McClintic-Marshall Co.; truss bridges, 1100 tons, to Fort Pitt Bridge Works.

Joseph A. Holpuch Co., theater and apartment building, Lincoln Avenue and Robey Street, Chicago, 523 tons, to American Bridge Co.

Southwestern Bell Telephone Co., building, St. Louis, 8000 tons, to Mississippi Valley Structural Steel Co.

Shea Theater, Buffalo, 1350 tons, to McClintic-Marshall Co.

J. K. Davison & Brother, Pittsburgh, 6 steel barges, 1000 tons, to American Bridge Co.

Delaware, Lackawanna & Western Railroad, canopy for Hoboken Terminal, 122 tons, to Phoenix Bridge Co.

Union Trust Co., Cleveland, Woodland Branch Bank, 200 tons.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

Cranleigh Hospital, New York, building, 350 tons.

East St. Louis, Ill., power station, 2400 tons, bids in.

Columbia University, New York, two buildings, 1600 tons, bids in.

High school, Norwood, Mass., 104 tons.

Santa Fe System, 1925 bridge requirements, 25,000 tons.

Northern Pacific Railway, bridge work including 36 deck plate girder spans and one 120-ft. through riveted truss span, 2000 tons.

Federal Reserve Bank, Denver, Colo., vault framing, 450 tons.

Federal Reserve Bank, Omaha, Neb., vault framing, 450 tons.

Peabody Coal Co., coal washery, Arnot, Pa., 185 tons.

Pacific Fruit Express Co., shop buildings, Nampa, Idaho, 550 tons.

Fulton Iron Works, St. Louis, 6 sugar mill buildings for export, 330 tons.

A. C. Spark Plug Co., Detroit, building, 180 tons.

Paige-Detroit Motor Co., Detroit, building, 125 tons.

Wayne County, Mich., Road Commissioners, grade separation, 460 tons.

Whitney Estate, Detroit, garage, 1200 tons.

Ward Brothers Baking Co., Chicago, building, 150 tons.

Illinois Women's Athletic Club, Chicago, 3000 tons, revised figures taken.

Yosemite Valley Railroad, Cal., viaducts, 3000 tons.

Denver, Colo., riveted pipe line, 2000 tons.

Irrigation project near San Francisco, 3600 tons.

RAILROAD EQUIPMENT BUYING

Fair Volume of Car Purchases—Southern Pacific Inquires for 18 Locomotives

Inquiries for cars show a slight increase this week with a total of 2568 in the market from various railroads. Orders also were in better volume, totaling 4015. Steel underframes continued active with about 2000 under inquiry, but purchases were light. The Southern Pacific came into the market for 18 locomotives.

The Elgin, Joliet & Eastern, reported in the market for 500 steel underframes, will build them in its own shops.

The Great Northern Railway has closed on a spreader with the O. F. Jordan Co., East Chicago, Ind.

The Pennsylvania Railroad is expected to come into the market shortly with a fair sized inquiry for cars.

The Great Northern Railway Co., reported last week in the market for 1000 steel underframes, is asking for 1500.

The Wabash Railway is asking for 200 automobile cars.

The Southern Pacific is inquiring for 18 coal-burning locomotives.

The Huntingdon & Broad Top Mountain is reported to be intending to purchase 50 hopper cars.

The Central of Georgia is inquiring for 500 steel underframe box cars of 40 tons capacity.

The Canadian National Railways will inquire for 1000 box cars, 1000 automobile cars and 250 refrigerator cars.

The Buffalo Creek & Gauley has ordered repairs on 150 hopper cars from the Pressed Steel Car Co.

The Long Island Railroad has closed on 15 caboose cars with the Pressed Steel Car Co.

The Northern Pacific is inquiring for 18 gondola cars.

The Texas Co. has closed on 1000 tank cars of 10,000 gal. capacity with the Pennsylvania Car Co.

The New York Central has placed 3000 all steel 55-ton box cars as follows: 1000 for the Big Four with the American Car & Foundry Co.; 1000 for the Michigan Central with the Standard Steel Car Co.; 500 for the main line with the Western Steel Car & Foundry Co.; 500 for the main line with the Merchants Despatch Transportation Co.

The Chicago & North Western has formally issued inquiry for 24 coaches, 23 baggage and 3 combination baggage and mail cars.

British Pig Iron and Steel in October

LONDON, ENGLAND, Nov. 17 (*By Cable*).—The pig iron production in October was 586,400 gross tons, an increase over the September output of 569,200 tons. The total steel output in October was 678,500 tons, comparing with 645,000 tons in September.

Comparative production figures for the British steel industry in gross tons per month are as follows:

	Pig Iron	Steel Ingots and Castings
1913, per month	855,000	639,000
1920, per month	669,500	755,600
1921, per month	217,600	302,100
1922, per month	408,300	486,000
1923, per month	619,800	707,400
January, 1924	631,500	690,100
February	612,700	767,600
March	668,600	825,200
April	618,400	711,500
May	650,900	809,700
June	607,800	651,500
July	615,600	693,300
August	588,900	527,500
September	569,200	645,000
October	586,400	678,500

The October pig iron output of 586,400 tons compares with an average monthly production of 632,500 tons per month for the first half. The steel output in October of 678,500 tons contracts with 741,900 tons per month to July 1, this year.

In line with the engineering assistance rendered to its customers through its industrial engineering department, the Air Reduction Sales Co., 342 Madison Avenue, New York, organized a special class of foremen, superintendents and other executives at the Airco-Davis-Bournonville Welding Institute in Jersey City, Nov. 17, for instruction on the theory and practice of the oxy-acetylene process, and the industrial phases of industrial gases, uses, application and plant distribution. Organization of new classes will be announced later.

BOOK REVIEWS

Management's Handbook. Edited by L. P. Alford. Pages xxxii + 1607 +vii, 4½ x 7¼ in. Illustrations 639, including about 225 forms. Published 1924 by Ronald Press Co., New York. Price, $7.50.

For many years we have had handbooks on technical subjects in such profusion that in many cases the user had to make careful choice. This, however, is the first handbook of management that has come to our notice. As a pioneer publication in its field, it is impressive in the almost bewildering diversity of the information contained. It deals with hundreds of questions which come before the business or plant manager in his everyday work, including production control, material handling, cost analysis, purchasing, storekeeping, shipping, traffic, budgeting, banking and management ratios.

Included in the front part of the work is a volume of basic data not ordinarily found in such a publication, but of decided value to the managing executive. This includes industrial statistics based on Census Bureau reports, the utilization of power in manufacturing, business indicators as to quantity of production in various lines, statistics of production in many of the important products, price figures, cost of living data, wages, employment figures, immigration and emigration, industrial accidents and much else that an industrial manager should know. In addition to this are mathematical and engineering data heretofore associated primarily with engineering handbooks per se.

Graphics take a separate chapter, with comparisons of different methods of plotting and utilizing information both for operations of individual units in an organization and for the larger matters with which the management deals directly.

Details are given of the design and equipment of industrial plants, showing such items as ventilation, illumination, heating, fire escapes, materials of construction, power, etc. Layouts of particular departments are shown in some detail. Office management is carefully covered, both as regards general offices and plant offices. Filing, the drafting room, stenographic departments, moving of mail, and the use of forms for recording operations receive large attention.

Much of the work is devoted to industrial relations, particularly with regard to wage payment plans, the work of the employment manager and the many other points of contact between employer and employee. Different methods of bonus and premium payments and machine rates are developed, with tables and diagrams illustrating the operations of the various systems.

There are 32 chapters or sections of the work, each carrying at its head its own table of contents, in addition to which the contents tables are grouped at the beginning in a 32-page summary. The fact that the index occupies 85 pages tells its own story of the amount of cross indexing possible and of the readiness with which information on any subject may be reached. The editor was assisted in his work by 35 expert contributors to the various chapters. If there is one cause for regret it is that the bibliography in the last few pages was confined to the publications of the present publisher. A more comprehensive bibliography would add to the value of the book.

We see great usefulness for this book. It gives every promise that with the successive revisions to which a handbook is subject it will grow into an institution.

NEW TRADE PUBLICATIONS

Rail Benders.—Engineering Products Co., Peoples Gas Building, Chicago. A 12-page folder carrying price lists and descriptions of rail benders, track drills, gages and levels.

Doorways.—Richards-Wilcox Co., Aurora, Ill. 24-page folder devoted to door and window hardware. Some of this is designed for the use in doors of very large size. One case illustrated shows four doors in an opening 40 ft. wide and 17 ft. high, each door weighing 2300 lb. These are moved in pairs by one man. Particular attention is given in the pamphlet to industrial problems of this character.

Indicating Pyrometer.—Bristol Co., Waterbury, Conn. Model 420 for wall or switchboard use and high resistance supersedes model 319. The new instrument is described in bulletin 330 of two pages. It can be furnished for all ranges up to 3000 deg. Fahr.

Automatic CO_2 and Draft Recorder.—Joseph W. Hays Corporation, Michigan City, Ind. Sixteen-page booklet of operating instructions covering the company's automatic CO_2 and draft recorder. Illustrations are numerous and the text is clear. The operation of the Hays CO_2 recorder, which in general is the same as that of the Hand Orsat, is also described, and repair parts are listed and illustrated.

Calendar.—National Acme Co., Cleveland. Calendar for 1925, made up of 12 sheets, size 12 x 15 in. The calendar is at the lower half of each sheet, is white on blue and is contained in a rectangle 5½ x 8½ in. Three months, the previous, present and succeeding month, are given on each sheet. In the upper half, in a rectangle 6 or 8½ in., are photographic reproductions of the company's automatic screw machines, dieheads, screws and other products. The sheets are contained in a stiff backed envelope, the front of which is cut away to show the lower and upper rectangles.

Brass Facts.—Scovill Mfg. Co., Waterbury, Conn. Booklet of 26 pages describing briefly the uses and the methods of manufacture of various brass alloys. A classification including chemical composition of several brass mill alloys is included, and temper and degrees of hardness are explained. A section is devoted to annealing or degrees of hardness, the illustrations showing the microstructure of annealed and rolled brass are included. Pages are given to the selection and care of the proper brass for the job.

Pyrometers.—The Bristol Co., Waterbury, Conn. A leaflet describing a new model of high resistance indicating pyrometer recently brought out by the company. Among several strong features pointed to are the wide scale, extra resistance movement, automatic cold-end condenser, low chamber area and high torque.

Electric Furnaces.—Ajax Electrothermic Corporation, Trenton, N. J. A four-page leaflet giving a list of the principal users of high frequency furnaces and a description of some of the various types and what they will do.

Sheet Metal Working Equipment.—J. M. & L. A. Osborn Co., Cleveland. Catalog No. 24; pages 248, 6 x 9 in., bound in cloth. Lists roofing plates, tin plate, sheet copper, black, blue annealed and galvanized sheets, conductor pipe elbows and a wide variety of other roofers' and tinsmiths' materials, including furnace pipe and fittings. Several pages are devoted to side wall, floor and other registers. A broad choice of snips, hammers and other tools are illustrated as well as shears, folders and bending brakes, forming machines and bench machines. A variety of power machinery is described and illustrated. The book is well arranged and is indexed for convenient reference. Many tables of useful data are included.

"Standards of Practice for Rubber Belting," is the title of a 75-page booklet issued recently by the Boston Woven Hose & Rubber Co., Cambridge, Mass. The pages are 6 x 9 in. and the illustrations, which include several line sketches, number more than 70. A section is devoted to the principles of rubber belting and another to the construction and characteristics of the company's Bull-Dog belting, which is intended for steady drives and heavy loads. The characteristics of Perfection belting for light loads, high speeds and variable pull are also outlined, and a section is devoted to the application and care of both types of belting. Rules and formulae for figuring various transmission problems are given in several pages. The booklet is clearly written and the illustrations are large and well arranged.

Plans of New Companies

The Yorkville Sheet Metal Works, 208 East Seventy-fourth Street, New York, has been incorporated with $10,000 capital stock to take over a business in the manufacture of sheet metal products and roofing. Harry Feder is president and H. Herzog, treasurer.

The Lincoln Forging Co., Detroit, has been organized as a subsidiary of the Monarch Mfg. Co., that city. It is planned to make most of the castings used by the parent company in the forging plant, which will be operated by the new company. In a new plant recently built, the company will do outside jobbing in brass and bronze forging. James Whilly is manager.

The Emerson Radio & Phonograph Corporation, New York, recently incorporated with $1,000,000 capital stock, to manufacture phonographs, radio equipment, etc., represents a consolidation of the Emerson Radio Corporation and the Emerson Phonograph Co., both of New York. Benjamin Abrams, 307 Sixth Avenue, New York, is one of the principals.

The Automatic Oil Heating Corporation, 350 Madison Avenue, New York, incorporated with $50,000 capital stock, to manufacture oil burners and oil burning equipment, will limit present efforts to distribution of these products, which are now manufactured in St. Louis. Definite plans as regard manufacturing have not yet been formed. R. S. Beale is vice-president.

The National Labeling Machine Co., 358-60 Fourth Avenue, Long Island City, N. Y., recently incorporated, is a reorganization of the company by that name which for several years has manufactured motor-driven and hand-operated labeling machines. This year the company is planning also to produce an automatic labeling machine.

The McGrew Machine Works, 2124 Y Street, Lincoln, Neb., has been incorporated to manufacture hardware specialties and sheet metal products, including folding camp furniture. E. E. McGrew is president.

Hurst Farr, Inc., 103 Park Avenue, New York, recently incorporated with $20,000 capital stock, to manufacture metal screens, is a reorganization of a former Delaware corporation which has been established for five years. Operations are under way. J. Frost and S. H. Goldberg are the chief incorporators.

The Roussel Mfg. Co., Maspeth, L. I., has been incorporated with capital stock of $15,000, to manufacture cabinets. The business is now operated on a limited scale. E. Roussel heads the company.

The Productive Machine Tool & Parts Co., 416 Broome Street, New York, which recently was incorporated with $50,000 capital stock to operate as dealer in machine tools and parts, is the continuation of a similar business formerly conducted at 74 Grand Street.

The Sheffield Trimming & Stamping Corporation, 211 Center Street, New York, incorporated with $25,000 capital stock, has taken over a machine shop which will be used in the manufacture of radio instruments and equipment. D. Stutson and M. and F. Greitzer are the incorporators.

The Lion Steel Ware Corporation, 18 East Seventeenth Street, New York, incorporated with $150,000 capital stock, will manufacture a general line of metal products.

The New York Pressing Iron Co., 62 East Eighth Street, New York, has been incorporated with $50,000 capital stock and plans to manufacture household specialties made of iron.

The Dahlbender-Hague Corporation, 501 Fifth Avenue, New York, recently organized to manufacture radio instruments, will confine immediate activities to those of distributor. However, manufacturing may be undertaken at some later time, in which case the work will be done by contract. Alfred Hague is one of the principals.

The International Duplex Air-Rotors Corporation, 301 Madison Avenue, New York, recently incorporated with $1,000,000 capital stock, to manufacture a new design of ventilating machine, has negotiations under way for a plant at Poughkeepsie, N. Y. According to present plans, most of the parts will be manufactured under contract. Louis Burger is president.

The Champion Electric Co., 3711-41 Forest Park Boulevard, St. Louis, has been organized to manufacture Champion endurance motors in single-, two-, and three-phase and split-phase types. Previously these motors were manufactured by the Champion Shoe Machinery Co., which owns and controls the new organization. E. P. Fritschle heads the company.

The Standard Gas & Equipment Corporation, recently incorporated in Maryland, represents the merged interests of the William M. Crane Co., Baltimore Gas Appliance & Mfg. Co. and the General Gas Appliance Co. The corporation will operate in three divisions, manufacturing gas equipment. Offices will be maintained in Baltimore and New York. George H. Warner is president.

The Sword Oil Burner Co., Inc., 852 North Broad Street, Philadelphia, has been organized by Carl F. Tinnermann and Thomas K. Bell who, for the past five years, has been engaged as material expert for the U. S. Navy. The company will act as representative of the Sword & Kimber Co., 4816 Stenton Avenue, Philadelphia.

Ferrobrandt, Inc., Park-Lexington Building, Forty-sixth Street and Park Avenue, New York, has been incorporated with $100,000 capital stock to act as American distributor of the ornamental iron products produced by the Brandt interests of France.

The Liberty Spring Bumper Mfg. Corporation, care of D. DeMillo, 1775 Broadway, New York, recently incorporated with $200,000 capital stock to manufacture automobile bumpers, has plans under negotiation whereby operations are expected to begin in about two weeks. Incorporators are M. Mosesco and F. Smetter.

The Pittsburgh Terminal Coal Co., incorporated with a capitalization of $4,000,000 of 6 per cent cumulative preferred stock and $12,000,000 common stock, will take over the merged interests of the Pittsburgh Terminal Coal Co. and the Meadowlands Coal Co. Estimates place the holdings of the new company at 20,000 acres of coal land with an annual output of approximately 15,000,000 tons. The Pittsburgh Terminal Coal Co., which is a subsidiary of the Pittsburgh & West Virginia Railway, has plans now before the stockholders proposing to segregate the coal properties from the railroad property.

The O. E. Frank Heater & Engineering Co., 80 West Genesee Street, Buffalo, organized to manufacture heating equipment, is located at the Farrar & Trefts plant, consisting of a foundry occupying 10 acres and equipped to pour castings of 50 tons or more. It also has a large tank and boiler shop which covers a city block. Products include a line of U-tube and straight tube storage heaters and instantaneous heaters for use in power plants with bleeder turbines. Vapor condensers and heat exchanges for oil refineries also will be made. Olive E. Frank, president and secretary, was formerly sales manager of the Albergar Heater Co. and manager of the expansion joint department of the Howard Iron Works. John C. Trefts, president Farrar & Trefts, Inc., and the Brown Car Wheel Works, is treasurer.

The Por-Cell Mfg. Co., Inc., 471 Hudson Avenue, Brooklyn, recently incorporated with $100,000 capital stock to manufacture radio equipment, is erecting a large plant which will be used in the manufacture of batteries enclosed in sheet metal containers. The product consists entirely of porcelain and steel. Plans provide for early production. Irving Beck is president; Emil Kameny, vice-president and secretary, and Benjamin Beck, treasurer.

The Goshen Cushion & Body Co., Goshen, Ind., has been incorporated with $33,000 capital stock to manufacture spring cushions for automobile trucks, engine cabs, etc. The new company has purchased the equipment of the Goshen Buggy Top Co. and leased the building which was occupied by that company. Amasa Hoovens is president, T. A. Brainard, vice-president, and O. M. Kinnison, secretary-treasurer.

The International Steel Cross Tie Co., 6300 Southwood Avenue, St. Louis, recently organized to manufacture as indicated, is still in the formative stage and is not prepared at this time to make any definite statement regarding plans. M. W. Wambaugh, consulting engineer, St. Louis, is one of the principals.

Joseph C. Brady will open a new modern plant for electro-plating and finishing at 82 Clifford Street, Providence, R. I., under the firm name of J. C. Brady Co.

John J. Normoyle, dealer in factory supplies, with warehouse at Thirtieth Street and Fourth Avenue, Moline, Ill., has purchased the entire plant of the D. M. Sechler Implement & Carriage Co. It is understood that the material and equipment, including drill presses, bulldozers, planers, lathes, punch presses, etc., will be offered for resale.

The Pittsburgh office of the Northern Engineering Works, Detroit, James B. Laird, manager, has been moved from Room 544 Union Trust Building to Room 954 of the same building.

Machinery Markets and News of the Works

INQUIRIES MORE NUMEROUS

Quotations Being Obtained by Railroads for Estimating Purposes

Ajax Motors Co. Expected to Take Action Shortly on Standard Tool Requirements

THERE has been an increase in the volume of inquiry in all machine-tool buying centers, although there has been but slight improvement in the volume of orders placed. The outlook is regarded as more promising than for some time.

Quotations are being obtained by railroads for estimating purposes in connection with the making of budgets, and this is taken to indicate a more or less extensive buying program for next year.

The National Carbon Co., which purchased 11 inclinable presses, two lathes and a milling machine, is inquiring for a 28-in. lathe, a universal grinder and a heavy-duty drilling machine.

An inquiry has been received for two wet tool grinders and a 6-ft. radial drill from the Pennsylvania Railroad.

Bids on a large list of metal, wood-working and other equipment for the new William Beaumont High School, St. Louis, will be opened Dec. 3. The list, which includes 80 items, is published elsewhere in this issue.

The Ajax Motors Co., Racine, Wis., is expected to take action shortly on its standard machine-tool requirements. The purchase of forging equipment for the Ajax plant will be made by the Nash Motors Co., Kenosha, Wis., which is about to place a number of board drop hammers.

A number of engine lathes were purchased by the Paige Motor Co., Detroit, and the Carnegie Steel Co. bought a number of machines during the past ten days. The Lehigh Valley Railroad took several machine tools during the week.

Approximately 40 machine tools remaining in the plant of the Winton Co., Cleveland, will be auctioned Nov. 20.

New York

NEW YORK, Nov. 18.

SINGLE tool inquiries are rapidly accumulating, a fair proportion coming from industrial users and a substantial number from railroads for estimating 1925 appropriations. Railroads in the New England district have been obtaining quotations on single items but generally for estimating. The New York Central is expected to close shortly on a large turret lathe. The Lehigh Valley Railroad has closed on its list of tools, purchases including a combination journal turning and axle lathe, a 6-ft. radial drill, four shapers and a 23-in. lathe from one seller; a 42-in. lathe and a 90-in. journal turning lathe from another and a carwheel borer from a third. Among industrial users who have bought are the Inland Steel Co., purchaser of a 1500-lb. steam hammer and the McKane & Terry Drill Co., Dover, N. J., a 30-in. x 14-ft. 6-in. bed engine lathe. The New York Central closed on a 6-ft. radial drill. Thus far inquiry is considerably in excess of purchases.

The Brooklyn Metal Stamping Co., 718 Atlantic Avenue, Brooklyn, has leased a building at 11-17 Bond Street, Brooklyn, comprising about 18,000 sq. ft. of floor area, for a new works. A portion of the building will be used for the manufacture of wireless equipment.

W. H. McMillan's Sons, 153 South Street, New York, manufacturer of tackle blocks, plan for the construction of a one-story building, 80 x 120 ft., at their plant at 40 Penn Street, Brooklyn, to cost about $45,000 with equipment. Adolph Goldberg, 166 Montague Street, Brooklyn, is architect.

New interests have acquired the brickyard property on the Hudson River at Dutchess Junction, near Beacon, N. Y., formerly held by the Tinomey Estate and comprising 87 acres. The new owners will install modern equipment. A railroad siding will also be laid.

The City of New York, Department of Water Supply, Gas & Electricity, 2358 Municipal Building, New York, has plans for two two-story automobile service, repair and shop buildings, 25 x 75, and 40 x 100 ft., respectively, at Houghton and Quinby Avenues, to cost $85,000 with equipment. Nicholas J. Hayes, commissioner, is in charge.

The North American Copper Co., 52 Vanderbilt Avenue, New York, has leased a one and two-story factory, 80 x 170 ft., at 194-210 Van Brunt Street, Brooklyn, to be constructed by the New York Dock Co., 44 Whitehall Street, New York, estimated to cost about $40,000. The Turner Construction Co., 244 Madison Avenue, New York, has the building contract.

Victor Mayper, 15 East Fortieth Street, New York, architect, has plans for a two-story automobile service, repair and garage building at 80-86 King Street, to cost $100,000 with equipment.

Murray Klein, 39 Graham Avenue, Brooklyn, architect, has plans for a two-story automobile service, repair and garage building, 100 x 125 ft., at 477-87 Gates Avenue, Brooklyn, estimated to cost about $85,000 with equipment.

The Swedish Chamber of Commerce, United States of America, 2 Broadway, New York, has received an inquiry from a company in Sweden, desiring to get in touch with American manufacturers of copper wire bars (inquiry No. T-1369).

The Sinclair Consolidated Oil Corporation, 45 Nassau Street, New York, has arranged for a bond issue of $15,000,000, a portion of the proceeds to be used for extensions and improvements. Harry F. Sinclair is head.

The Board of Education, Newark, has awarded contract to the J. S. & L. Carlson Co., Montclair, N. J., for the erection of its proposed three-story and basement vocational school at Irvington, estimated to cost $250,000, for which plans were prepared by Guilbert & Betelle, Chamber of Commerce Building, Newark, architects.

The Public Service Electric & Gas Co., Public Service Terminal Building, Newark, has acquired property, 188 x 417 ft., on the Passaic River, near Clay Street, Newark, as a site for an automatic substation. It is expected to begin work early in the spring.

The Federal Metal Bed Co., 816 Clinton Street, Hoboken, N. J., has awarded contract to the H. K. Ferguson Co., Cleveland, for a one-story foundry addition, 135 x 140 ft., estimated to cost $38,000.

The Egyptian Lacquer Mfg. Co., Fortieth Street and Fifth Avenue, New York, will begin work at once on a two-story addition to its plant at Kearny, N. J., 33 x 40 ft., for which a contract was recently awarded Eustice Brothers, 111 Academy Street, Newark. Lockwood, Greene & Co., 109 East Forty-second Street, New York, architects, prepared the plans.

G. J. Lowres & Co., 11-15 Runyon Street, Newark, have tentative plans for rebuilding portions of its works, for the manufacture of optical goods, damaged by fire Nov. 13 with loss of $30,000.

Buffalo

BUFFALO, Nov. 17.

THE Continental Can Co., Inc., Syracuse, has arranged for a stock issue aggregating $3,564,000, a portion of the proceeds to be used for expansion.

The Buffalo Toy & Tool Works, 522 Broadway, Buffalo, has tentative plans for the rebuilding of the portion of its works recently damaged by fire with loss of $35,000 including equipment.

The Houde Engineering Corporation, 1392 West Avenue, Buffalo, manufacturer of hydraulic machinery, will begin work at once on a new plant, 120 x 180 ft., estimated to cost $125,000 with equipment. Frank Hanssel, Ellicott Square, Buffalo, has the building contract. G. Morton Wolfe, 1357 Main Street, is the architect.

The Northern New York Utilities, Inc., Watertown, N. Y., has preliminary plans for three hydroelectric power units on the Beaver River, in the vicinity of Soft Maple, Sewell Island and High Falls, estimated to cost $750,000. Floyd L. Carlisle is in charge.

The Saskatchewan Cooperative Elevator Co., Ltd., Regina, Sask., has awarded contract for the super-structure of its $800,000 grain elevator to be erected at Buffalo, N. Y., for which hoisting, conveying, electric power and other equipment will be required. F. W. Riddell is general manager.

Bids will be received until Dec. 2 by the Board of Public Utilities, City Hall, Jamestown, N. Y., for furnishing two electrical pumps to replace equipment now in use at the Buffalo Street pumping station. Melvin O. Swanson is director and engineer in charge. Louis T. Klauder, Philadelphia, is consulting engineer.

Haverstick & Co., Inc., Ford Street, at the foot of Spring Street, Rochester, N. Y., has been appointed general distributer for western New York for Holt caterpillar tractors and Sargents' snow plows.

Philadelphia

PHILADELPHIA, Nov. 17.

THE Pennsylvania Railroad Co., Philadelphia, has plans for new engine house and shops at Oak Street and East Broadway, Toledo, Ohio, to cost approximately $500,000 with machinery. William H. Cookman, Philadelphia, company architect, prepared the plans. A. C. Shand is chief engineer.

Manual training equipment will be installed in the new three-story and basement high school, to be erected by the Board of Education, Philadelphia, estimated to cost $1,000,000, for which plans are being prepared by Irwin T. Catherine, architect for the board, Keystone Building, Philadelphia.

Durham Brothers, 1611 Sansom Street, Philadelphia, architects, have plans for a two-story automobile service, repair and garage building, 48 x 67 ft., estimated to cost $45,000 with equipment.

Contract has been awarded Frank J. Shuler, Boyer Arcade, Norristown, Pa., for a one-story machine shop, 60 x 180 ft., for the Peoples Sanitary Dairy, Swede and Markley Streets, Norristown.

The Board of Education, Indiana, Pa., plans the installation of manual training equipment in a new three-story and basement high school, 54 x 185 ft., estimated to cost $400,000, for which a building contract has been awarded the J. G. Fullman Co., East End Savings & Trust Building, Pittsburgh. Thayer & Johnson, 39 North Jefferson Street, New Castle, Pa., are architects.

W. & J. Sloane, Inc., Fifth Avenue and Forty-seventh Street, New York, has commissioned Lockwood, Greene & Co., 100 East Forty-second Street, New York, architects and engineers, to prepare plans for its proposed linoleum manufacturing works with power house, machine shop, etc., at Hutchinson's Mills, near Trenton, N. J., estimated to cost close to $450,000 with machinery. Nelson Clark is in charge of details.

The Foreign Trade Bureau, Philadelphia Commercial Museum, has received the following inquiries: 42858, from Benjamin Brothers, Han Franses 12 Saloniki, Greece, desiring to get in contact with American manufacturers of galvanized sheet metal, metal furniture products, etc.; 42868, Edobori-Minamidori, Nishiku, Osaka, Japan, interested in metal ceilings, metal furniture products, electrical specialties; 42875, from Yankee Brazilian Agency, Rua da Candelaria, 44 Rio de Janeiro, Brazil, desiring to get in contact with producers of cutlery, carpenters' and cabinet makers' tools, asbestos goods, wire fencing and netting, etc.; 42876, from Carlos Gonzales Rubio C., 12 Plaza Bolivar, Barranquilla, Colombia, interested in machinery for the manufacture of boxes.

The Atlantic Refining Co., 260 South Broad Street, Philadelphia, will install additional stills and auxiliary equipment at its Philadelphia and Franklin, Pa., refineries.

The General Diecasting Co., Reading Pa., will begin work on the first unit of a plant, 60 x 150 ft., for which contract has recently been awarded to the Boston Construction Co., Inc., 1713 Sansom Street, Phialdelphia. Two additional buildings will be erected later. The plant will give employment to about 300 operatives.

Manual training equipment will be installed in the three-story and basement high school, 140 x 140 ft., to be erected by the School District, Hughesville, Pa., on site recently acquired to cost about $250,000.

Charles Schaef, 11 South Sixteenth Street, Philadelphia, architect, has issued a call for bids for a two-story and basement automobile service, repair and garage building, 57 x 103 ft., at Broad and Elser Streets, Philadelphia, to cost $65,000 with equipment.

The Department of Streets and Public Improvements, and the Department of Public Safety, Trenton, N. J., have taken over the former plant of John E. Thropp Sons Co., Lewis Street, Trenton, devoted to the production of boiler grates and castings, for $180,000. It will be utilized as a municipal machine shop and repair works.

The Budd Wheel Corporation, Budd Building, Philaaelphia, has awarded contract to the Wark Co., 1609 Walnut Street, for a one-story addition.

New England

BOSTON, Nov. 18.

WHILE the machine-tool market cannot be called active, more business is noted than in many weeks. Sales include seven new tools, consisting of lathes, shapers and threading equipment, motor-driven, to a local shop; a shaper, lathe, upright drill, a wet tool and a surface grinder, new and used tools, to a fine tool manufacturer of Boston; between $5,000 and $6,000 worth of new and used repair shop equipment to a New England cotton mill for its new plant in the South; a fair sized milling machine to a local concern, several 16-in. and larger used lathes to Boston and other shops, and a fairly large line of miscellaneous equipment to diversified industries. There is also under negotiation considerable equipment that probably will be sold on a Jan. 1 bill dating basis. New inquiries are increasing, but largely for one and two tools. Current transactions largely concern prospects that have been hanging over the market for weeks or months.

Flexible steel belt lacing has been reduced from 48 to 52 per cent discount.

Announcement is made by Lewis-Shepard Co., 566 First Street, South Boston, handling equipment, erecting a one-story, 54 x 300 ft. plant on Walnut Street, Watertown, Mass., that present equipment is sufficient for all requirements.

Plans are nearly complete for a three-story technical and classical high school to cost $750,000 including equipment, to be built by the city of Newton, Mass. George M. Angier is chairman of the school commission.

The Massachusetts Gear & Tool Co., 30 Nashua Street, Woburn, Mass., has started the erection of a one-story, 30 x 73 ft. manufacturing plant. Plans are private.

Chadwick & Trefether, Bow Street, Portsmouth, N. H., has started work on a one-story, 50 x 80 ft. addition. J. Edward Richardson, 56 Grove Street, Dover, N. H., is the architect.

Manufacturing quarters have been secured at 288-304 A Street, South Boston, by the Keystone Mfg. Co., Boston, toys. Bench equipment may be purchased by the company.

The Nashua River Paper Co., East Pepperell, Mass., has started the erection of a one-story, 75 x 314 ft. mill addition to cost approximately $100,000 without equipment. W. E. Truesdale, 5 Beekman Street, New York, is the architect.

The Wickwire Spencer Steel Corporation's annealing and cleaning mill, Spencer, Mass., recently completely destroyed by fire will be rebuilt. Some new equipment will be required.

The B. Malouf Patent Co., Worcester, Mass., automobile parts, has purchased land on Shrewsbury Street, on which it will erect a plant next spring. For the present production of carburetors, compression air-brakes and stop-light signals will be in a part of the Farrah Embroidery

The Crane Market

A FAIR volume of inquiry for both electric overhead traveling cranes and locomotive cranes is reported. A contributing factor to good feeling in the market is the increase in purchases. This is less noticeable in locomotive cranes than in the overhead field. A considerable part of the present activity seems to be on the part of the larger companies for one or two pieces of equipment. Still pending in locomotive crane inquiries are those of the New York Central and the Lehigh Valley. An inquiry for a 50-ton, one-motor stationary hoist was recently sent out by the Phoenix Utility Co., 71 Broadway, New York. The 200-ton overhead crane for the New York Edison Co. is still pending. The Barstow Management Association, Reading, Pa., is reported to have closed on a 75-ton overhead crane with a prominent crane builder. The American Steel & Wire Co., which has been in the market for 101 single I beam cranes and electric hoists for installation at its various plants, has closed on the equipment for the Worcester mills.

In the Pittsburgh district inquiry is reported better than actual business and it is believed in some quarters that higher quotations will be the rule in the future.

Among recent purchases are:

Guggenheim Brothers, 120 Broadway, a 10-ton, 37-ft. 6-in. span, 3-motor overhead traveling crane for Tocopilla, Chile, from the Whiting Corporation.

New York Engineering Co., 2 Rector Street, New York, a 5-ton hand power trolley and 5-ton hand power hoist for Valparaiso, Chile, from the Reading Chain & Block Corporation.

Morgan Construction Co., Worcester, Mass., two 10-ton electric traveling cranes, from the Shepard Electric Crane & Hoist Co.

Public Service Production Co., Newark, N. J., a 3½-cu. yd. Bucket handling crane for the Bath Portland Cement Co., Sands Eddy, Pa., from a Mid-Western crane builder.

Philadelphia Electric Co., Philadelphia, a 125-ton, 114-ft. span electric crane, from a local builder.

New London Ship & Engine Building Co., Groton, Conn., a 5-ton, 57-ft. span electric crane from an Eastern crane builder.

J. G. White Engineering Corporation, 43 Exchange Place, New York, a 50-ton electric crane for the Staten Island Edison Co., New York, from the Whiting Corporation.

American Steel & Wire Co., twenty ¼-ton, single I beam cranes with electric hoists for the Worcester plant, from the tramrail division of the Cleveland Crane & Engineering Co.

Patrick McGovern, Inc., New York, contractor, four 10-ton crawl tread locomotive cranes for use in Philadelphia, reported to have been purchased from the Northwest Engineering Co.

American Steel & Wire Co., Worcester, Mass., a 25-ton locomotive crane from the Ohio Locomotive Crane Co.

Grand Trunk Railroad, for Battle Creek, Mich., a 4-ton, grab-bucket crane from the Shaw Electric Crane Co.

Union Metal Products Co., Chicago, a 15-ton, 3-motor, overhead crane, from the Shaw Electric Crane Co.

Wyman-Gordon Co., Worcester, Mass., a 2-ton, 2-motor overhead crane from the Shepard Electric Crane & Hoist Co.

Great Northern Railway, St. Paul, Minn., a 30-ton locomotive crane and ditcher, from the Industrial Works.

& Lace Co. plant. B. Malouf is president of the new company which is capitalized for $250,000.

The Tower Mfg. Corporation, 98 Brookline Avenue, Boston, radio appliances, will immediately send out inquiries on equipment required for the manufacture of a popular priced loud speaker. The company plans to have an initial production of 1000 loud-speakers per day. It is booked ahead well into next year on ear-phones and head-sets.

Joseph E. Knox & Co., 380 Broad Street, Lynn, Mass., manufacturers of rubber and cutting dies, have awarded contract to William T. Reed Co., 200 Devonshire Street, Boston, for a one-story addition, 42 x 113 ft., to cost $50,000.

Plans are in progress for the erection of a power house at the plant of the Eastern Steam Laundry, 941 Massachusetts Avenue, Cambridge, Mass., estimated to cost $45,000, for which Lockwood, Greene & Co., 24 Federal Street, Boston, are engineers.

E. N. Adams, 86 Everett Street, Arlington, Mass., architect, has plans for a two-story automobile service, repair and garage building, 100 x 200 ft., at Old Colony Avenue and D Street, South Boston, estimated to cost $175,000 with equipment.

The W. W. Mildrum Jewel Co., East Berlin, Conn., manufacturer of jewelry, has work under way on a new building, one and one-half stories, 36 x 70 ft., to replace a structure recently destroyed by fire. The Gianotta Construction Co., Kensington, has the contract. Oscar Benson is head of the company.

The Wing & Engel Box Co., Oldtown, Me., has tentative plans for the rebuilding of its plant destroyed by fire Nov. 5, with loss of $75,000 including equipment.

The Perry Buxton-Doane Co., 216 West First Street, Boston, Mass., iron, steel and other metals, has awarded contract to the O. D. Purington Co., Providence, R. I., for a branch works on Latham Street, Providence.

Reorganization plans have been completed by the Herreshoff Mfg. Co., Bristol, R. I., manufacturer of yachts, and tentative plans are said to be under way for extensions.

St. Louis

ST. LOUIS, Nov. 17.

THE Arkansas Central Power Co., Little Rock, Ark., has arranged for a stock issue of $496,000, a portion of the proceeds to be used for extensions and improvements.

The Wichita Railroad & Light Co., 1113 Main Street, Wichita, Kan., will build a one-story brick machine shop and repair works to cost about $75,000, including equipment.

Bids will soon be asked for pumping equipment, motors, etc., to be installed in the water purification plant, Wetunka, Okla., to cost about $53,000, for which bonds recently were voted. A 400-hp. Diesel engine and auxiliary equipment will be required in connection with rebuilding the electric plant, to cost about $61,000. V. V. Long & Co., Colcord Building, Oklahoma City, are engineers.

The Iron Hill Ore Co., Chaoina, Mo., has plans under way for an ore-milling plant to cost $130,000 with machinery. The Doane Consulting Service, 119 South Fourth Street, Poplar Bluff, Mo., is engineer. Edward Newman, 1202 Times Building, St. Louis, is president.

The Board of Education, Paseo, Mo., plans the installation of manual training equipment in the four-story and basement high school, 150 x 290 ft., estimated to cost about $1,500,000, for which plans have been completed.

The Collier-Adams Mfg. Co., St. Joseph, Mo., manufacturer of sash, doors, etc., has awarded contract to T. W. Hackett, 1023 Church Street, for a three-story and basement plant, 75 x 250 ft., estimated to cost $100,000, for which plans were recently prepared by E. R. Meier, Lincoln Building, St. Joseph, architect.

The Massey-Harris Harvester Co., Inc., Batavia, N. Y., plans the erection of a new assembling plant at Hutchinson, Kan., for which plans are being prepared.

The Skelly Oil Co., Tulsa, Okla., has sold a note issue of about $2,000,000, a portion of the proceeds to be used for extensions and improvements. William G. Skelly is president.

The St. Louis Steel Casting Co., 100 Malt Street, St. Louis, has inquiries out for one hydraulic vertical press for straightening steel castings, 200 to 300 tons in weight.

The Burnett Scoggins Lumber Co., Clayton, Okla., has tentative plans for the rebuilding of its planing mill recently damaged by fire with loss of $85,000 including equipment.

The Berry Iron & Steel Co., St. Joseph, Mo., is inquiring for a used 50,000 lb. testing machine capable of determining tensile strength, yield point and elastic limit.

Cincinnati

CINCINNATI, Nov. 17.

MACHINE-TOOL sales are light, but inquiries are considerably more numerous and pending business is encouraging. The largest reported sale was for a number of engine lathes to the Paige Motor Co., Detroit. Some single orders for heavy machines came from the railroads and a local manufacturer has an order for a planer from the South African Railways. The Carnegie Steel Co. bought a number of machines the past 10 days. There is some activity in metal-forming ma-

chinery, and several orders were booked by manufacturers in this district. Business in small tools and accessories is keeping up well and used machinery dealers also find a considerable betterment in trade over the past few weeks.

The Gem City Sheet Metal Co., Dayton, Ohio, recently incorporated, was formerly known as the Gem City Tin Shop. It will manufacture a general line of sheet metal products, specializing on a hot air register shield. W. S. Elters, 1135 Germantown Street, is president.

The Harman-Burton Coal Co., Zanesville, Ohio, has leased 3000 acres in Salt Creek Township, Muskingum County, Ohio, and plans an expenditure of $500,000 in developing the property. It is planned to install aerial tramways from the mine to the Ohio Power Co.'s new plant at Philo. R. C. Burton, Zanesville, heads the company.

The City Council, Murfreesboro, Tenn., plans for improvements in the municipal waterworks, including the installation of new pumps and other equipment, to cost about $150,000. J. L. Lowe is city manager.

Ostendorf & Harris, 860 Riverview Avenue, Dayton, Ohio, architects, have plans for a three-story and basement automobile service, repair and garage building, 87 x 125 ft., at Main and Franklin Streets, estimated to cost $125,600 with machinery.

Otto Roth, 920 State Avenue, Cincinnati, will build an automobile painting and repair works at Dutton Street and State Avenue, to cost close to $75,000.

Chicago

CHICAGO, Nov. 17.

ALTHOUGH actual bookings of machine-tool dealers have shown little change since election, plans of prospective buyers were given impetus and are expected to bear fruit in the form of orders before long. That the railroads are preparing an extensive buying program for 1925 is indicated by requests for quotations for estimating purposes in connection with the formulation of budgets. The Illinois Central, in fact, may place orders as early as December for delivery next year. The Ajax Motors Co., Racine, Wis., has made no further purchases but will take action on standard machine-tool requirements shortly. The purchase of forging equipment for the Ajax plant is being handled by the parent company, the Nash Motors Co., Kenosha, Wis., which is about to place a number of board drop hammers. The Union Metal Products Co., Chicago, has closed for a number of punches and shears and a 6-ft. radial drill, and is considering the purchase of board drop hammers instead of steam hammers, as originally planned. The Ress Machine Co., Lincoln, Neb., has bought a used 32 x 32-in. x 8-ft. planer in this market.

Charles E. Larson & Sons, 2643-59 North Keeler Avenue, Chicago, have awarded contract for a one-story forge shop to cost $23,000.

The Illinois Bell Telephone Co., 212 West Washington Boulevard, Chicago, has awarded contract for a one-story addition and alterations to a telephone exchange at 6045 Kenwood Avenue to cost $74,000.

The Nelson Machine Co., manufacturer of cement machinery and automobile accessories, has located in the former shops of the Coldwater Machine Works, Coldwater, Mich. The company purchased the equipment of the Hinkley Machine Shop, West Chicago Street. L. D. Nelson is manager.

The Wabash Railway has purchased 109 acres in North Kansas City, Mo., as a site for a round house, machine shops, office buildings, and yards.

The Rinard Mfg. Co., Rinard, Ill., recently incorporated with $40,000 capital stock, has leased a building, 24 x 60 ft., and will manufacture a ratchet wrench, specially made for the No. 4 connecting rod of Ford automobiles, with four sockets and one extension that will fit practically any nut on the Ford. It will also make an emergency axle for Ford cars to replace the rear axle so that in case of a fracture a driver may go to a repair shop on his own power. The company will need milling machines, automatic screw machines, a geared punch press, a double-spindle drill press, tumbling mill, hardening pot and a nickeling process outfit. Officers include Lester Pittman, president, and Logan R. Ellis, secretary and treasurer.

The W. H. Clark Mfg. Co., 1408 Cortland Street, Chicago, recently incorporated with $36,000 capital stock, expects to manufacture electrical instruments for factories. The company's manufacturing quarters include 1500 sq. ft. at the address given and the majority of work which will be done will be handled on punch presses. Officers are Wendell H. Clark, president and treasurer, and Samuel H. Clark, vice-president and secretary.

The Argo Iron & Metal Co., 311 North Curtis Street, Chicago, is receiving bids for a three-story addition to its plant, for which plans were prepared by Fox & Fox, 38 South Dearborn Street, Chicago, architects. S. Steinberg is president.

Electric motors, conveying and other equipment will be installed in the two-story and basement printing plant, 55 x 105 ft., to be erected by the *Daily Nonpareil*, Council Bluffs, Iowa, estimated to cost about $85,000. Anderson & Spooner, 26 South Main Street, architects, prepared the plans.

The Red Star Cement Co., 140 South Dearborn Street, Chicago, has preliminary plans for the construction of a new cement mill at La Salle, Ill., to cost approximately $2,000,000 including equipment.

The Haynes & Kinder Co., 2250 West Chicago Avenue, Chicago, manufacturer of electric and other signs, has awarded contract to the Austin Co. for a one-story and part basement plant at 2600 North Kildare Avenue, 120 x 125 ft., estimated to cost $140,000 with equipment.

The Board of Education, Luverne, Minn., is reported to be planning the installation of manual training equipment in a two-story and basement high school, 160 x 160 ft., to cost about $250,000. D. A. Leicher is clerk of the board.

The G. & W. A. Refrigerator Co., Cloquet, Minn., has awarded contract to Carlson & Schurr, Cloquet, for a two-story plant, 75 x 100 ft., estimated to cost $55,000.

The Domestic and Foreign Commerce Department, Chicago Association of Commerce, 10 South La Salle Street, has received the following inquiries: 4159, from a concern in Osaka, Japan, desiring to get in contact with American manufacturers of oil engines, wireless instruments and equipment; and 4162, from a company in Quincy, Ill., interested in wire-bound shipping cases.

Refrigerating machinery, mechanical handling equipment, etc., will be installed in the four-story and basement plant to be erected at Forty-sixth and Loomis Streets, Chicago, for Buehler Brothers, Inc., 4201 South Halsted Street. H. C. Christensen, 7959 Aberdeen Street, Chicago, architect, prepared the plans.

The Cedar Rapids Foundry & Machine Co., Cedar Rapids, Iowa, has inquiries out for a surface grinder and punch press, 2 in. stroke or larger.

Work will begin on the hydroelectric power plant to be built by the Knife River Mining Co., Beulah, N. D., estimated to cost $3,000,000.

The City Council, Bridgeport, Neb., plans the construction of a new municipal electric light and power plant. The Henningson Engineering Co., National Building, Omaha, is engineer.

The Universal Toy & Mfg. Co., 3217-19 Larimer Street, Denver, has been organized with capital stock of $150,000, to manufacture mechanical toys and later may contract for some of the work. It is fully equipped but is in the market for ¼ in. pipe, 7/16 in. cold rolled shafting, ¾, ⅞ and 1 in. strap iron, other metal products and wheels. H. D. Locke is secretary.

Pittsburgh

PITTSBURGH, Nov. 17.

MACHINE-TOOL business is not very brisk, but a large volume of inquiry has come out and there is a very general belief that it is indicative of active buying early next year. There is a disposition to withhold details because of a fear of increasing competition, but there is no question that the lists of the Central Tube Co. and the Carnegie Steel Co. for the Edgar Thomson Works, are not the only ones of importance now before the trade.

Considerable activity lately has marked the electrical equipment market. The Bethlehem Steel Corporation has placed for its Cambria works four 3000-kw. three-machine motor generator sets; two 3000-hp. 150-300 r.p.m., 250 volt d.c. motors and two 1500 hp. 150-300 r.p.m. motors and controls; two 2000-kw. three-machine motor generator sets; one 3000 hp. 150-300 r.p.m., one 1500 hp., 150-300 r.p.m. motors together with switchboard and controls for the Lackawanna works with the Allis-Chalmers Mfg. Co. The Crescent Portland Cement Co., Wampum, Pa., has bought

two 3000-kw. high-pressure condensing steam turbine units with surface condensing apparatus from the Westinghouse Electric & Mfg. Co.

Contract has been awarded by the Oil Well Supply Co., Oil City, Pa., for the erection of a one-story addition, 60 x 100 ft.

The Parsons-Muster Memorial Works, Sharon, Pa., has acquired property in Sharpsville, Pa., upon which it is planned to erect a two-story monumental works to cost $35,000. Grinding, polishing and other machinery will be required. H. H. Parsons heads the company.

The Pennsylvania Plate Glass Co., James City, Pa., is in the market for 36 grinding and polishing machines, and other equipment.

T. E. Cornelius, Magee Building, Pittsburgh, architect, has plans for a three-story and basement automobile service, repair and garage building, 75 x 110 ft., on Fourth Avenue, Coraopolis, Pa., estimated to cost about $85,000 with equipment.

McKenna Brothers, Latrobe, Pa., have acquired the Service Tool Co., formerly operating at Newark, N. J., and will remove the works to Latrobe where a building has been secured. Additional equipment will be installed. The company will operate with capital of $200,000. John B. Moore, formerly associated with the Latrobe Tool Co. will be general manager.

Fire, Nov. 10, destroyed a portion of the plant of the Salem Cooperative Window Glass Co., Salem, W. Va., with loss estimated at $75,000. It will be rebuilt.

The Donato Cut Stone Co., Bedford, Pa., has inquiries out for a 3-way crane, 3 to 7½-ton capacity, 50-ft. span.

The Board of Education, Pittsburgh, Pa., plans the installation of manual training equipment in a junior and senior high school to cost $2,400,000, complete, for which plans were prepared by Robert Maurice Trimble, Ferguson Building, Pittsburgh, architect.

Detroit

DETROIT, Nov. 17.

DODGE BROTHERS, INC., Joseph Campau Avenue, Detroit, has preliminary plans for a one-story addition to be equipped as a forge shop. Smith, Hinchman & Grylls, 800 Marquette Building, Detroit, are architects and engineers. Harry J. Popeney is secretary.

The Consumers Power Co., Jackson, Mich., has work under way on a new power house at Kalamazoo, Mich., to include the installation of two 400-hp. boilers, and auxiliary equipment, estimated to cost $40,000. The company also plans the construction of new coke ovens at its gas plant.

The Peerless Portland Cement Co., Union City, Mich., has filed plans for two new buildings at its Detroit works, to be one-story, 80 x 320 ft. and 82 x 265 ft. respectively, estimated to cost $240,000.

The Watts Laundry Machinery Co., St. Joseph, Mich., has completed plans for an addition to plant No. 2 at Benton Harbor, Mich., to cost approximately $40,000 with equipment.

The Hupp Motor Car Corporation, 3501 East Milwaukee Street, Detroit, has work nearing completion on a new factory for the manufacture of straight-eight Hupmobile cars, estimated to cost $1,250,000 including machinery.

The Peninsula Granite & Marble Works, Iron Mountain, Mich., has inquiries out for power saws, planers and other equipment.

Indiana

INDIANAPOLIS, Nov. 17.

THE Indiana Hydro-Electric Power Co., Norway, Ind., has awarded a contract to the L. E. Myers Co., 53 West Jackson Boulevard, Chicago, for the construction of the second unit of its power development on the Tippecanoe River, at Oakdale, Ind., estimated to cost $2,000,000.

The Thomas Madden & Son Co., Fletcher Avenue and the Big Four Railroad, Indianapolis, Ind., furniture manufacturer, is taking bids on a one-story addition, 80 x 200 ft., for which plans were prepared by J. Edwin Kopf & Wooling, 402 Indiana Pythian Building, Indianapolis, architects. E. J. O'Reilly is president.

The International Harvester Co., 608 South Michigan Avenue, Chicago, will soon begin work on a one-story addition, 80 x 500 ft., at its Fort Wayne, Ind., works, estimated to cost $50,000, for which contract has been awarded to the Austin Co.

Manual training equipment will be installed in the new high school to be erected by the Board of School Trustees, New Albany, Ind., to cost approximately $300,000.

Plans are being prepared by the Interstate Public Service Co., 1100 J. F. Wild Bank Building, Indianapolis, for three hydroelectric power plants. The first will be located at New Bristol, Ind., estimated to cost $800,000; the second at Baintertown, near New Paris, Ind., to cost $200,000, and the third at New Benton, Ind., to cost $200,000. E. J. Albrecht, 35 South Dearborn Street, Chicago, is consulting engineer.

The Tokheim Oil Tank & Pump Co., Wabash Avenue, Fort Wayne, Ind., has rejected all bids, and will have revised plans prepared for its new three-story works estimated to cost $50,000. Guy Mahurin, 425 Standard Building, is architect; C. O. Griffin is secretary.

S. F. Bowser & Co., Inc., Fort Wayne, Ind., manufacturer of gasoline and other pumping equipment, has disposed of a bond issue of $2,200,000, a portion of the proceeds to be used for expansion. S. B. Bechtel is president.

Cleveland

CLEVELAND, Nov. 17.

THE machinery market showed further improvement the past week in orders and inquiries and the outlook is more promising than for some time. The National Carbon Co. purchased 11 open-back inclinable presses, two lathes and a drilling machine and has an inquiry out for a 28-in. lathe, Universal grinding machine and a heavy duty 2-in. drilling machine. The new equipment will be installed in the plant recently purchased on West Seventy-third Street and formerly belonging to the Standard Parts Co. This plant will be used for the manufacture of radio batteries. The General Phonograph Co., Elyria, Ohio, is buying about a dozen machines, including six presses. The Vic-Tor Axle Co., Cleveland, purchased a 750-ton press. The F. E. Myers & Brother Co., Ashland, Ohio, purchased a sliding head drilling machine. Local machinery houses have received an inquiry from the Pennsylvania Railroad for two wet tool grinders and a 6-ft. triple purpose radial drill.

The equipment remaining in the automobile plant of the Winton Co., Cleveland, including lathes, milling machines, shapers, drilling and grinding machines, in all about 40 machines, will be offered for sale at auction Nov. 20.

The American Gypsum Co., Port Clinton, Ohio, has awarded contract to the Austin Co. for a new plant in Cleveland. It will be a steel frame structure, 60 x 130 ft.

The Valve Bag Co. of America, Summit and Suder Streets, Toledo, Ohio, has awarded contract to the H. J. Speiker Co., Toledo, for a factory addition, three stories and basement of brick, concrete and steel, 100 x 120 ft.

The Champion Spark Plug Co., Toledo, has awarded contract to the H. J. Speiker Co. for a one-story addition, 65 x 160 ft.

The Virden Co., 6105 Longfellow Avenue, Cleveland, will erect a one-story brick addition, 50 x 100 ft.

The Carey Machine Co., 5606 Curtiss Avenue, Cleveland, is placing contracts for a new one-story plant, 90 x 122 ft.

The H. P. Dodge Engineering Co., Jackson and Thirteenth Streets, Toledo, manufacturer of electric batteries, etc., has awarded a contract to William Boos, Toledo, for a two-story factory to cost $45,000.

J. P. Brannan, 8215 St. Clair Avenue, Cleveland, is reported in the market for a drill press, lathe, cylinder reboring machine and other equipment for a proposed garage and service station.

The American Electric Switch Co., Minerva, Ohio, is in the market for a 100-hp. fuel oil engine.

Milwaukee

MILWAUKEE, Nov. 17.

MANUFACTURERS of machine tools are satisfied with inquiries which are developing, and while new business is limited the impression is growing that December trade will probably be more active than that of any month this year. Makers of automotive parts and materials are manifesting renewed interest in equipment and the gas engine industry likewise is furnishing some moderate orders.

The Harvey Spring & Forging Co., Racine, Wis., manufacturer of automobile springs, is about to double the capacity of its plant by the erection of an addition to the heat treating building, one story, 100 x 144 ft. Ground was broken Nov. 15. Pending its completion, the present plant will be operated with a night shift as well as the day crew of 225 operatives.

The Wisconsin Power & Light Co., Fond du Lac, Wis. has let the general contract to the Immel Construction Co., local, for erecting a brick and steel building, 67 x 170 ft., three stories and basement, as a general service shop, garage and office. It will cost about $65,000. F. W. Whitely is general manager.

The Shawano, Wis., Common Council will take bids about Nov. 27 for furnishing and installing the pumps, motors and other equipment for a new 200,000-gal. water supply addition, designed by L. P. Pelishek, local engineer. D. E. Westcott is city clerk.

The Bell Machine Co., Oshkosh, Wis., let the general contract to the Fluor Brothers Construction Co., local, for erecting a $50,000 addition to its plant. It manufactures wood-working machines, specializing in tools for automobile body factories. A large order is being filled for the André Citroen automobile works in France.

The Jacobson Auto Co., 207 East Washington Avenue, Madison, Wis., has plans by Edward Touch, local architect, for a new public garage, sales and maintenance building, 95 x 120 ft., two stories and part basement, to cost $100,000 complete.

The B. Hoffmann Mfg. Co., 257 Sixth Street, Milwaukee, plumbers' and steamfitters' supplies and materials, has acquired a site, with buildings, at 1809 St. Paul Avenue, and will erect a $65,000 addition, 55 x 170 ft., to be used as a machine shop, pipe shop, storage and offices. The general contractors are Klug & Smith, 67-69 Wisconsin Street, local.

Pacific Coast

SAN FRANCISCO, Nov. 12.

THE Board of Supervisors of Los Angeles County, Baldwin Park, Cal., plans the construction of a one-story machine shop and service building, 40 x 80 ft., on site recently selected.

The Payne Furnace & Supply Co., 162 North Los Angeles Street, Los Angeles, heating equipment, has acquired a site at Foothill Road and Third Street, Beverly Hills, 150 x 180 ft., for the erection of a new plant, estimated to cost $100,000 with equipment.

The Lodi Union High School District, Lodi, Cal., is asking bids for the erection of a one-story manual training building to cost $45,000 with equipment, for which plans were prepared by Wright & Satterlee, Bank of Italy Building, Stockton, Cal., architects.

The Premier Spring & Bed Co., San Francisco, will soon commence work on the first unit of its new two-story plant at Third and Bancroft Avenues, 90 x 490 ft., for which a general contract was recently awarded to the Industrial Construction Co., San Francisco. The entire works will involve about $200,000. Walter J. O'Brien, 315 Montgomery Street, San Francisco, is architect.

The Board of Education, Los Angeles, plans the installation of manual training equipment in the new junior high school at Percy and Indiana Streets to cost $200,000. Plans have been completed by Hunt & Burns, Loughlin Building, Los Angeles, architects.

The Murray Cabinet & Show Case Co., Fresno, Cal., has work in progress on a one-story brick plant on E Street to cost approximately $30,000. Jolly & Jolly, Fresno, have the building contract.

The Tia Juana River Irrigation District, San Diego, Cal., has commissioned J. F. Covert, National City, engineer, to prepare plans for an irrigation works including pumping plant, reservoir, etc., estimated to cost $200,000, for which bonds will soon be voted.

Gulf States

BIRMINGHAM, Nov. 17.

BIDS will soon be asked by the Greenville Cotton Oil Co., Greenville, Tex., for the construction of a new plant estimated to cost $300,000, replacing a former works destroyed by fire.

The San Antonio Water Supply Co., 106 Market Street, San Antonio, Tex., will build an addition to the Mission pumping station, to cost close to $50,000, including the installation of pumps, pumping equipment, motors, etc., to double the present capacity. R. J. Harding is general manager.

The Connors Steel Co., Birmingham, has preliminary plans for rebuilding the portion of its plant destroyed by fire Nov. 5 with loss estimated at $25,000.

The Common Council, Hazlehurst, Miss., plans for improvements in the municipal electric light plant and waterworks system to cost $50,000. H. A. Mentz, Magnolia, Miss., is consulting engineer.

The Imperial Sugar Co., Sugarland, Tex., will begin work on a new filter plant and char house at the local refinery of the Sugarland Industries, Inc., recently acquired. Improvements will be made in other units, including additional equipment. The work is estimated to cost $1,000,000. W. T. Eldridge and G. D. Ulrich, Sugarland, head the company.

The Houston Lighting & Power Co., 1201 Capitol Avenue, Houston, Tex., has completed plans for the second unit of its Houston works, estimated to cost $6,000,000, and will begin work in about 90 days.

The Central Power & Light Co., Gonzales, Tex., has acquired the Gonzales Water Power Co. and the Gonzales Electric Light Co., and will merge the properties. Plans are under way for expansion to include the installation of pumps, and two engines at the waterworks; generators, dynamos, etc., at the electric lighting plant.

The Estes Lumber Co., 2600 North Twenty-eighth Street, Birmingham, has tentative plans for rebuilding its planing mill destroyed by fire recently with loss of $50,000 including machinery.

The Louisiana Oil Refining Corporation, Shreveport, La., is disposing of a bond issue of $3,500,000, a portion of the proceeds to be used for additions to plants and equipment.

Fire, Nov. 8, destroyed the molding room, machine shop and foundry of the Lucey Mfg. Co., Houston, Tex., manufacturer of oil well equipment, with loss of $150,000 including machinery.

The American Body Co., Dallas, Tex., has plans completed for a one-story works, 120 x 225 ft., for the manufacture of commercial automobile bodies.

The Greenville Hoop Co., Greenville, Miss., has tentative plans for the rebuilding of its mill, recently damaged by fire with loss of $50,000.

The Tennant Co., Houston, Tex., engineer, has inquiries out for one 175 to 200-hp. Heine-type watertube boiler, 150-lb. pressure, without super-heaters, for oil-firing, and one 150-kw., 400-volt, three-phase, 60-cycle, steam engine generator set.

The Kilby Car & Foundry Co., Anniston, Ala., is considering plans for rebuilding its local foundry recently damaged by fire with loss of $35,000.

The Birmingham Engine & Machinery Corporation, Birmingham, has inquiries out for one 100 to 125-kva., 220-volt, alternating current generator, complete with switchboard and exciter.

The Talladega Foundry & Machine Co., Talladega, Ala., incorporated with capital stock of $125,000 to manufacture cast iron ornamental posts and cast iron pressure water pipe specials, will build an addition to its plant which will double present capacity. New machinery will be purchased. L. H. MacDonald is one of the principals.

The Vulcan Rivet Corporation, Box 302, Birmingham, is in the market for a 1½-in. Acme all-steel rivet machine.

The Johnson Aeroplane Corporation, Delray, Fla., recently incorporated with capital stock of $50,000, plans to manufacture a new design of airplane. Manufacturing will be done by contract at first. J. C. Johnson is president.

South Atlantic States

BALTIMORE, Nov. 17.

THE Broad River Power Co., Arcade Building, Columbia, S. C., has arranged for a stock issue of $1,250,000, a portion of the proceeds to be used in connection with the acquisition of the Columbia Railway, Gas & Electric Co., and its subsidiaries, the Parr Shoals Power Co. and the Columbia Gas Light Co. The Broad River company has work in progress on a steam power plant to develop an ultimate capacity of 65,000 kw., with transmission lines to Columbia, Spartanburg and Batesburg, S. C.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, until Nov. 25 for miscellaneous equipment, including carbon and high speed twist drills, schedule 2890; taps, dies, tap wrenches and die stocks, schedule 2893, and hammers, schedule 2894.

The Shenandoah River Light & Power Corporation and the Page Power Co. have merged and will operate under the last noted name. The new organization will be capitalized at $800,000. Plans are in progress for extensions and improvements in the systems.

The Charles E. Lambert Motor Co., 10 West First Street,

Charlotte, N. C., has acquired property at A and Moreland Streets, 83 x 170 ft., as a site for a two-story automobile service and repair works to cost $45,000 with equipment.

The City Council, Amherst, Va., plans the installation of pumping equipment in connection with new waterworks and an electric plant, for which bonds were recently voted for $75,000.

The Kaufman Construction Co., Denton, Md., is considering tentative plans for rebuilding its cement-block manufacturing works, recently destroyed by fire.

The Shelby Supply Co., Shelby, N. C., has inquiries out for milling machines, drill press, lathes, saws and other tools.

Wallace E. Hance, Hollyoak, Del., architect, is completing plans for a two-story automobile service, repair and garage building, 55 x 65 ft., to be erected at Wilmington, estimated to cost $45,000 with machinery.

James A. McFarland and W. J. Loyd, Dalton, Ga., and associates, have organized the Dalton Brick & Tile Co., to erect a plant about three miles south of Dalton, to be ready for service by Feb. 1.

The Wilson-Hock Co., City Point, Va., machinery dealer, has inquiries out for a portable coal conveyor or loader with three-phase, 60-cycle, 220-volt motor; 300 kw., 1200-am., 250-volt motor-generator, direct connected to three-phase, 60-cycle, 2220-volt about 450 hp. synchronous a. c. motor, 250 excitation voltage; pumps, triplex, 12 x 12 and 8 x 10 x 12 size; tower tank of 50,000 to 100,000-gal capacity, and one 37 to 50 kva. transformer, single-phase, 60-cycle, 13,200-volt high tension, 2200-volt low tension.

The Davidson & Kennedy Co., 872 North Ashby Street, Atlanta, Ga., manufacturer of oil mill machinery, contemplates the construction of a new plant at Hornady and Jefferson Streets.

Canada

TORONTO, Nov. 17.

A FAIR demand for machine tools continues in this market. While buying is mostly for replacement and orders are for units of one or two, the outlook is bright. Announcements are being made with regard to the erection of electrical development projects, pulp and paper mills and various other construction for which tools will be required, and it is expected that the Dominion Government will within the next two or three weeks award contracts for considerable railroad equipment.

A. Maxwell, Clark's Harbour, N. S., will purchase tools and other equipment for a machine shop.

F. J. Silverthorne, Stayner, Ont., is in the market for a drill press, lathe, etc.

S. H. Swedlove, Stouffville, Ont., will purchase woodworking machinery for a furniture factory.

The Mitchell Mfg. Co., Mitchell, Ont., is having plans prepared for a one-story factory, 100 x 450 ft., to manufacture concrete mixing and handling machinery. The plant is estimated to cost $150,000.

The Canadian Concrete Products Co., will erect a factory at Belleville, Ont., for supplying the Canadian market.

Western Canada

The Hage Timber & Investment Co., Ltd., Port Coquitlam, B. C., is having plans prepared for a sawmill to cost $200,000 and will soon call for bids.

The West Canadian Collieries, Ltd., Blairmore, Alta., will install additional equipment at its works at Bellevue, Alta.

The Luscar Collieries, Luscar, Alta., will install additional equipment at its local properties.

Alabama Pipe Corporation

Final steps have been taken in the consolidation of pipe companies in the South to form the Alabama Pipe Corporation, whose plans were given in detail in THE IRON AGE of Aug. 21. Recently, incorporation papers were filed in Alabama, with authorized capital stock of $4,000,000 in preferred and 80,000 shares of common stock. T. E. Kilby, formerly governor of Alabama, is chairman of the board and W. P. Johnson is president. Headquarters will be located at Anniston, Ala.

Among the group comprising the merger are makers of sanitary and soil pipe, gas and water pipe. Otto Agricola sold his pipe shop at Gadsden, Ala., to the promoters of the consolidation and the Hammond-Byrd Iron Co. interests disposed of their Coosa Pipe & Foundry Co., and the Gadsden Pipe Co., both of Gadsden; also two plants of the Talladega Pipe Co. and the Imperial Pipe Co., Bessemer, Ala. In the holdings of the Alabama Pipe Corporation are the following:

Coosa Pipe & Foundry Co., Gadsden; Gadsden Pipe Co., Gadsden; Agricola Pipe Co., Gadsden; Talladega Pipe Co., Talladega, two plants; Imperial Pipe Co., Bessemer; Superior Pipe Co., Bessemer; Ornamental Foundry Co., Anniston; Standard Foundry Co., Anniston, including a water pipe plant; Alabama Pipe & Foundry Co., Anniston; Union Foundry Co., Anniston; and the recently purchased Rabe Pipe & Foundry Co., Chattanooga, Tenn.

STEEL AND INDUSTRIAL STOCKS

The range of prices on active steel and industrial stocks from Monday of last week to Monday of this week was as follows:

	Low	High		Low	High
Allis-Chalmers ..	60⅛	64	Inland Steel	38⅛	40½
Allis-Chalm. pf...100		101½	Int. Har.....	96¼	103½
Am. B. S. & Fdy.	82½	84	Int. Har. pf.....113		114
American Can....141		153½	Lima Loco.	61⅝	65½
Am. Can. pf.....116¼		118	Midvale Steel.....	25¼	26¼
Am. Car & Fdy..167½		174½	Nat.-Acme	4⅝	5
Am. C. & F., pf..121½		124½	Nat. En. & Stm.	21½	23⅞
American Loco...	81⅝	85⅝	N. Y. Air Brake.	43	48¼
Am. Loco. pf....118		119¼	Otis Steel.....	7¼	8¼
Am. Radiator 122		124½	Otis Steel pf.....	46	55
Am. Radiator pf.123½		124	Pressed Stl. Car.	44½	50
Am. Steel Fdries.	38½	40⅝	Pressed Stl. pf...	75	80
Am. Stl. Fdr. pf.108½		109½	Replogle Steel....	13⅛	15⅞
Baldwin Loco.....121⅝		126	Republic	45	49⅞
Baldwin Loco. pf.115¾		116⅝	Republic pf.....	85	88
Bethlehem Steel..	42⅛	45	Sloss-Sheffield ...	70⅛	74¼
Beth. Stl. 7% pf.	91	92½	Sloss-Sheffield pf.	90¾	91⅝
Beth. Stl. 8% pf.104		106½	Superior Steel....	26	28
Br. Em. Steel....	1⅝	2	Transue-Wms.	29	29
Br. Em. Stl. 2 pf.	7	7⅛	Un. Alloy Steel...	21	23
Chic. Pneu. Tool.	86	87	U. S. Pipe.....124¼		147¼
Colorado Fuel....	38	42¼	U. S. Pipe pf.....101		103
Crucible Steel....	57½	62⅝	U. S. Steel.....112⅝		115½
Crucible Stl. pf...	91	93	U. S. Steel pf....121⅞		122⅞
Deere pf.....82½		84	Vanadium Steel..	25⅛	28¾
General Electric..255½		270¼	Va. I., C. & Coke.	36	36
Gt. No. Ore Cert.	31¼	33⅛	W'house Air Br..	97	101½
Gulf States Steel.	73¾	76¾	Youngst'n S.&T..	64	65

American Rolling Mill Co. Earnings

Net earnings of the American Rolling Mill Co. for the third quarter amounted to $80,085, after expenses but before interest and Federal taxes, comparing with $1,823,586 in preceding quarter and $1,147,543 in the first quarter this year, making total of $3,051,214 for the first nine months.

Income account for the third quarter and for the nine months follows:

	Third Quarter	Second Quarter	First Quarter	9 Months
Net sales $5,913,664		$6,845,244	$9,053,499	$21,812,407
Oper. loss	26,466	*608,510	*1,028,431	*1,610,475
Other inc.....	106,551	1,215,076	119,112	1,440,740
†Net earn....	$80,085	$1,823,586	$1,147,543	$3,051,215

*Profit. †Before interest and Federal taxes.

Alabama Co. Properties Purchased by Sloss-Sheffield Steel & Iron Co.

The Sloss-Sheffield Steel & Iron Co., Birmingham, Ala., has offered $2,500,000 five-year 6 per cent purchase money lien notes to public subscription through Goldman, Sachs & Co., New York, proceeds to be used in the acquisition of the properties of the Alabama Co. The issue was quickly oversubscribed. Preliminary plans were outlined in THE IRON AGE, Oct. 16.

The Alabama Co., whose properties include the railroad connecting its Mary Lee coal mines with main lines at Birmingham, was incorporated in 1913 with capital stock of $4,000,000. It owns two blast furnace plants, ore, coal, coke and limestone properties, the Clifton furnaces at Ironton, Ala., and the Etowah furnace plants at Gadsden, Ala., each two stacks.

At Gate City, Ala., the company holds 1750 acres of land containing red ore, limestone and dolomite. About 2500 acres of mineral lands and 15,000 acres of timber lands were acquired with the Clifton furnaces, and about 750 acres of ore lands with the Etowah furnaces. Its ore mines on the Gadsden lands have a daily capacity of 600 tons. At Hematite, Ga., the company has 1700 acres of brown ore lands, with ore washers. Coal mines and coke ovens are operated at Searles, Lewisburg and Brookwood, Ala. Of 32,000 acres of coal and timber lands purchased from the Standard Oil Co., 7000 acres were sold. There are 915 beehive coke ovens on these properties and 350 at Lewisburg, comprising a total capacity of 300,000 tons. The Alabama Co. produces foundry and forge pig iron, and low-phosphorus, high-manganese iron, having a capacity of 300,000 tons.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of items the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE, under the general heading of "Iron and Steel Markets" and "Non-Ferrous Metals."

Bars, Shapes and Plates

	Per Lb.
Bars:	
Refined iron bars, base price	3.24c.
Swedish charcoal iron bars, base	7.00c. to 7.50c.
Soft steel bars, base price	3.24c.
Hoops, base price	4.49c.
Bands, base price	3.99c.
Beams and channels, angles and tees, 3 in. x ¼ in. and larger, base	3.34c.
Channels, angles and tees under 3 in. x ¼ in., base	3.24c.
Steel plates, ¼ in. and heavier	3.34c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	3.20c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	3.55c.
Toe-calk, ½ x ⅜ in. and larger	4.20c.
Cold-rolled strip, soft and quarter hard	7.00c.
Open-hearth spring steel	4.50c. to 7.00c.
Shafting and Screw Stock:	
Rounds	4.05c.
Square, flats and hex.	4.55c.
Standard tool steel, base price	15.00c.
Extra tool steel	18.00c.
Special tool steel	23.00c.
High-speed steel, 18 per cent tungsten	70c.

Sheets

Blue Annealed

	Per Lb.
No. 10	3.89c.
No. 12	3.94c.
No. 14	3.99c.
No. 16	4.09c.

Box Annealed—Black

	Soft Steel C. R. One Pass Per Lb.	Blued Stove Pipe Sheet Per Lb.
Nos. 18 to 20	4.30c. to 4.45c.	.....
Nos. 22 and 24	4.45c. to 4.60c.	5.10c.
No. 26	4.50c. to 4.65c.	5.15c.
No. 28*	4.60c. to 4.75c.	5.25c.
No. 30	4.70c. to 4.95c.	.....

Galvanized

	Per Lb.
No. 14	4.70c. to 4.85c.
No. 16	4.85c. to 5.00c.
Nos. 18 and 20	5.00c. to 5.15c.
Nos. 22 and 24	5.15c. to 5.30c.
No. 26	5.30c. to 5.45c.
No. 28*	5.60c. to 5.75c.
No. 30	6.10c. to 6.25c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

Welded Pipe

Standard Steel	Black	Galv.	*Wrought Iron*	Black	Galv.
½ in. Butt...	—41	—24	½ in. Butt...	— 4	+19
¾ in. Butt...	—46	—32	¾ in. Butt...	—11	+ 9
1-3 in. Butt..	—48	—34	1-1½ in. Butt.	—14	+ 6
2½-6 in. Lap.	—44	—30	2 in. Lap.....	— 5	+14
7-8 in. Lap...	—41	—11	2½-6 in. Lap.	— 9	+ 9
9-12 in. Lap..	—34	— 6	7-12 in. Lap..	— 3	+16

Bolts and Screws

Machine bolts, cut thread, 45 and 10 per cent off list

Carriage bolts, cut thread, 35 to 35 and 10 per cent off list

Coach screws, 45 and 10 per cent off list

Wood screws, flat head iron, 75, 20, 10 and 5 per cent off list

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSER	Per Lb.
Bright, basic	4.25c. to 4.50c.
Annealed soft	4.50c. to 4.75c.
Galvanized annealed	5.15c. to 5.40c.
Coppered basic	5.15c. to 5.40c.
Tinned soft Bessemer	6.15c. to 6.40c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	18⅛c. to 19⅛c.
High brass wire	18⅝c. to 19⅝c.
Brass rods	16⅛c. to 17⅛c.
Brass tube, brazed	26⅛c. to 27⅛c.
Brass tube, seamless	22½c. to 23½c.
Copper tube, seamless	23¾c. to 24¼c.

Copper Sheets

Sheet copper, hot rolled, 21⅜c. to 22⅜c. per lb. base.

Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.

Tin Plates

Bright Tin		Coke—14 x 20		
Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20		Prime	Seconds
		80 lb..	$6.15	$5.90
		90 lb..	6.30	6.05
		100 lb..	6.45	6.20
IC..$11.25	$8.85	IC..	6.65	6.40
IX.. 12.85	10.85	IX..	7.85	7.60
IXX.. 14.40	12.55	IXX..	9.00	8.75
IXXX.. 15.75	13.85	IXXX..	10.35	10.10
IXXXX.. 17.00	15.05	IXXXX..	11.35	11.10

Terne Plates

8 lb. coating, 14 x 20

100 lb.	$7.00 to $8.00
IC	7.25 to 8.25
IX	8.25 to 8.75
Fire door stock	9.00 to 10.00

Tin

Straits, pig	58c.
Bar	62c. to 65c.

Copper

Lake ingot	16½c.
Electrolytic	16 c.
Casting	15 c.

Spelter and Sheet Zinc

Western Spelter	7¾c.
Sheet zinc, No. 9 base, casks	11½c. open 12c.

Lead and Solder*

American pig lead	10c. to 10½c.
Bar lead	13c. to 15c.
Solder, ½ and ½ guaranteed	40c.
No. 1 solder	37c.
Refined solder	31c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.	75c. to 90c.
Commercial grade, per lb.	35c. to 50c.
Grade D, per lb.	25c. to 35c.

Antimony

Asiatic	17c. to 18c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.	36c.

Old Metals

The market continues strong and business is active. Dealers' buying prices are as follows:

	Cents Per Lb.
Copper, heavy crucible	11.75
Copper, heavy wire	11.25
Copper, light bottoms	9.75
Brass, heavy	7.00
Brass, light	5.75
Heavy machine composition	8.75
No. 1 yellow brass turnings	7.75
No. 1 red brass or composition turnings	8.25
Lead, heavy	7.75
Lead, tea	6.00
Zinc	4.00
Cast aluminum	16.00
Sheet aluminum	16.00